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National Aeronautics and
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For Release:
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RELEASE NO. 82-3

MATHEWS APPOINTED NASA-LANGLEY DEPUTY CHIEF COUNSEL

Hampton, Va.--John C. Mathews, III was recently named Deputy Chief Counsel of NASA's Langley Research Center in Hampton, Va.

In his new position, he will assist the Chief Counsel in providing advice, counsel and representation to all elements on all legal matters (except patents) affecting center operations.

Mathews began working for NASA in 1964 conducting legal research at the Marshall Space Flight Center in Huntsville, Ala. In 1968 he became Chief Counsel of the National Space Technology Laboratories in Bay St. Louis, Miss., and in 1976 Chief Counsel of the Dryden Flight Research Center at Edwards Air Force Base, Calif., where he remained until he transferred to Langley.

A native of Georgia, Mathews attended Bryan University in Dayton, Tenn., Auburn University in Auburn, Ala., and the University of Tennessee, where he received his Doctor of Jurisprudence in 1963.

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January 28, 1982

He is a member of the Federal Bar Association and Tennessee Bar Association.

Mathews, who lives in Hampton, is married to the former Barbara Jean Moore. They have a 17-year-old son, Mark, and a 15-year-old daughter, Ginger.

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RELEASE NO. 82-4

ADVEX CORPORATION RECEIVES NASA LANGLEY CONTRACT

Hampton, Va.--Advex Corporation has been selected for negotiation of a contract for the fabrication of two-dimensional airfoils and support hardware for NASA's Langley Research Center.

The cost-plus-award-fee contract will cover a period of three years, beginning about March 1. The value of the contract is approximately $2 million.

Under the terms of the contract, the firm will be responsible for the machining, fabrication and assembly of metal components and hardware.

The two-dimensional airfoils and support hardware are intended to be used in extreme environmental testing, such as cryogenic, high-temperature and/or high-load wind tunnels.

The work will be performed at Advex Corporation's facilities, located at 121 Floyd Thompson Drive, Hampton, Va.

January 28, 1982

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RELEASE NO. 82-5

HARVEY'S JANITORIAL SERVICE AWARDED CUSTODIAL CONTRACT

Harvey's Janitorial Service, Newport News, Va., has been awarded a contract to provide custodial support services at the Langley Research Center. The $2.9 million contract was awarded by NASA and the Small Business Administration under Section 8(a) of the Small Business Act of 1953.

The contract is for a one-year base period with two one-year option periods. The cost-plus-award-fee contract began Feb. 1.

The local, minority-owned firm will be responsible for all personnel, material, equipment and transportation needed to provide custodial services to the Langley Research Center facilities.

During fiscal year 1981, NASA awarded small business firms $409.4 million, including $138 million to minority-owned firms. Of these amounts, Langley awarded $56.7 million to small businesses, including $7.9 million to minorities.

Section 8(a) authorizes the SBA to enter procurements with federal agencies and, in turn, to subcontract the work to small disadvantaged businesses.

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February 5, 1982

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RELEASE NO. 82-9

S & Q CORPORATION AWARDED NASA LANGLEY CONTRACT

Hampton, Va.--The S & Q Corporation, South San Francisco, Calif., has been awarded a contract by the NASA Langley Research Center for the design and fabrication of components for a water jet propulsion system.

The components, a large diameter, high-pressure propulsion control valve, jet nozzel and safety gate system, will be used for the modification of the Aircraft Landing Dynamics Facility at Langley.

The Aircraft Landing Dynamics Facility enables Langley scientists to perform aircraft and spacecraft landing gear research.

The facility uses a water jet system to propel a test carriage equipped with landing gear along a rail/track system under simulated runway conditions.

The new propulsion system will be capable of accelerating the test carriage to 220 knots within 400 feet.

Under the terms of the firm-fixed-price supply contract, the S & Q Corporation will be responsible for the design, fabrication,

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February 17, 1982

assembly, delivery and tests of the propulsion system.

The contract is valued at approximately $1 million.

Most of the firm's work on the propulsion system will be performed at the firm's facility in South San Francisco, Calif.

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RELEASE NO. 82-10

TOLSON IS CHIEF SCIENTIST AT NASA-LANGLEY

Hampton, Va.--Robert H. Tolson is the new Chief Scientist at NASA's Langley Research Center in Hampton, Va. He replaces Dr. Frank Hohl, who died December 6, 1981. Tolson is former Head, Atmospheric Science Branch, Atmospheric Environmental Sciences Division.

As the Chief Scientist, Tolson is the principal advisor to the Director and Deputy Director for the overall quality and character of the Langley in-house, contractual and university research programs, and he advises on the needs and attitudes of the Langley research staff.

Tolson also has operating responsibility for the Director's Discretionary Fund, the Distinguished Research Associate Program, the Fund for Independent Research, the Floyd L. Thompson Fellowship Program, the Graduate Program in Aeronautics, the NAS/NRC Associateship Program, and the selection of the H.J.E. Reid Award receipient.

Tolson began his career at Langley in 1953 in the cooperative training program. As a co-op student, he was assigned to model fabrication shops and aerodynamic test facilities. While a senior at Virginia Polytechnic Institute, he wrote a paper on hypersonic stability which was selected as the best technical paper in a nationwide competition sponsored by the Institute of Aeronautical Sciences.

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February 25, 1982

After receiving a bachelor of science degree in aeronautical engineering in 1958, he worked in the Theoretical Mechanics Division, doing early studies of manned and unmanned lunar missions. He received a master of science degree in physics from VPI in 1963. Upon completion of a two-year fellowship in mathematics in 1964, Tolson returned to Langley to work on the Lunar Orbiter mission as a co-investigator in the Selenodesy Experiment. He received a NASA Group Achievement Award and a Langley Special Service Award for his participation in the mission.

In 1969 Tolson became Navigation Analysis Manager in the Viking Project Office, where he was responsible for spacecraft navigation during the interplanetary cruise and Mars orbital phases of the mission. He was appointed Head of the Planetary Physics Branch in the Environmental Space Sciences Division in 1972. During this time he was a member of the Viking Radio Science Team, responsible for the atmospheric and geophysical studies to be performed at Langley using Viking data. He was awarded the NASA Exceptional Service Medal for his work in these activities. He also was selected as a principal investigator in the GEOS-3 mission to determine the geoid from satellite altimeter data and was a co-investigator on the Pioneer Venus Orbital Drag Experiment.

In 1976 Tolson became Head of the Atmospheric Sciences Branch, AESD, responsible for completion of the Viking Radio Science experiments and for theoretical and data analysis research to study anthropogenic effects on the stratosphere and troposphere. In 1976 he was appointed Head of the Phobos-Deimos Encounter Team. This experiment, conceived at Langley, was part of the Viking Extended Mission, and resulted in the Viking Orbiter's passing within 100 km of both of the moons of Mars, yielding high-resolution images of the surfaces of both satellites and

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a determination of their masses. He received the NASA Medal for Exceptional Scientific Achievement and the NASA Group Achievement Award for his work on this experiment.

Tolson, a native of Portsmouth, has authored or co-authored over 50 technical publications, including NASA documents and articles in "Science," "Journal of Geophysical Research," Journal of Spacecraft and Rockets" and Geophysical Research Letters." In 1977 he was the co-recipient of the H.J.E. Reid Award for the best scientific or engineering paper written at Langley. He is a member of the American Institute of Aeronautics and Astronautics, the American Geophysical Union, and the American Association for the Advancement of Science.

Tolson and his wife, Carol, live in Newport News.

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RELEASE NO. 82-12

NASA TAKES MYSTERY OUT OF MYSTERY CLOUD

Hampton, Va. -- NASA researchers, with the help of laser probing data, have taken the mystery out of the "mystery cloud" that has covered Earth's northern hemisphere for the last several weeks.

Ruling out the possibility of an undetected nuclear detonation or a meteor impact, NASA-Langley Research Center's Dr. M. Patrick McCormick said the cloud is actually a layer of particulates that looks identical to data Langley researchers are accustomed to seeing from volcanic eruptions.

The fact that no major eruptions have been reported recently does not dissuade McCormick from his view: "It had to be one that had little local damage, but moved material high enough to get into the stratosphere, where it can travel around the world. Historically, information on the height of volcanic eruptions has proven unreliable due to, among other things, the difficulty of accurately observing them at night or through cloud cover."

Laboratory analysis of a small sample of the material, gathered by a high-flying NASA U-2 observation airplane March 6, is complete and confirms that the particulate plume is a sulfuric acid water mist, normally seen after volcanic eruptions. A background radiation count was also taken during the flight, revealing

- more -

March 11, 1982

less-than-normal readings for radiation at altitudes flown.

The flight was a regularly scheduled research flight, originating from Topeka, Kansas, that took data as far south as the Gulf of Mexico at elevations of 50 and 55 thousand feet. The plane is one of two U-2's belonging to NASA's Ames Research Center, Mountain View, California. The sample was analyzed at Ames.

Plans call for a series of U-2 follow-on flights with various instruments. Beginning March 23, the payload will include a quartz crystal microbalance from Langley capable of measuring the size distribution of particles as well as more data about their elemental composition.

McCormick, head of the Aerosol Measurements Research Branch at Langley, said the eruption probably occurred during the first two weeks of January or in late December 1981. The results were first observed by the Japanese Jan. 23 and then by another ground-based station in Mauna Loa, Hawaii, Jan. 28.

Not until Feb. 13 and 14, however, when a NASA research airplane flew from NASA's Wallops Flight Center on Virginia's Eastern Shore to Costa Rica, in Central America, did the evidence begin to overwhelmingly point to a volcanic eruption as the source of the high-altitude pollution.

The altitude and intensity of the cloud -- by then a diffused layer -- was detected continuously from Wallops, at 38 degrees north latitude, to Costa Rica, at 10 degrees north latitude.

A remote-sensing laser radar, looking upward from the plane, mapped the otherwise invisible layer as being approximately 10 miles high at the middle and an average of two to three miles thick.

Comparisons with volcanic emission data taken from 1979 through 1981 by a NASA satellite instrument called SAGE (Stratospheric Aerosol and Gas Experiment)

- more -

convinced Langley researchers that they were seeing the same pattern of particulate distribution. Furthermore, the closest match was with known volcanic eruptions that were about two months old, closely correlating to the suspected beginnings of the present emission.

The Langley instrument flown aboard the Wallops airplane recorded peak concentration at about 20 degrees north latitude, close to the latitude of Hawaii. This indicates to McCormick that the emission was probably a low-latitude eruption, perhaps between the equator and 20 degrees north, since atmospheric travel tends to be away from the equator. This information was given to Ames and used to direct the U-2.

A nuclear or meteoric source for the material is ruled out by McCormick for several reasons:

"Our laser radar data show the new aerosol (particulates) are equivalent to about one million tons or more of new material in the stratosphere. A nuclear explosion would not have produced that much mass. Also, there have been no reports of radiation increases typical of a nuclear explosion.

"In the case of a meteorite or meteorites, anything that could produce material of that magnitude would certainly have been noticed."

Even though the amount of particulates from this eruption appears to be greater than that from Mount St. Helens, it should not produce any significant cooling of the Earth's surface or have any climactic impact, according to McCormick, unless future measurements show greater density than now measured. Emissions from larger volcanoes can scatter, or reflect, sunlight back to space, tending to cool the surface of the Earth slightly. As eruptions go, the present emission is considered a small-to-moderate-sized eruption.

Langley researchers will continue taking laser radar data, although not

- more -

as far-ranging as the trip to Costa Rica. That flight was a previously-scheduled flight to Mexico and Central America, in cooperation with Drexel University and others, to gather local data on active volcanoes in those areas. Fortunately, researchers were able to gather data on the unexpected new material in the stratosphere during the same trip.

Other members of the atmospheric science community around the world will also continue taking ground-based laser radar and other data on the eruption.

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RELEASE NO. 82-23

NASA-LANGLEY HONORS INVENTORS

Hampton, Va.--Twenty-six NASA-Langley Research Center inventors who received United States patents in 1981, plus recipients of Langley's Technology Transfer awards, were honored at the annual Inventors' Luncheon Wednesday, April 7.

Dr. Donald P. Hearth, Langley Director, presented the awards. Guest speaker for the luncheon was Robert F. Allnutt, Acting Associate Administrator for External Relations at NASA Headquarters in Washington, D.C.

Technology Transfer awards were presented to Dr. Joseph S. Heyman and to the Materials Division. The citation accompanying Heyman's award read, "Outstanding Leadership in the Transfer of Technology, Through Applications Projects, Tech Briefs, Seminars, and Conferences, Resulting in an IR-100 Award, Assistance to Industry and Other Government Agencies, and the Commercialization of NASA Technology, Which Provided Substantial Benefits to the Public and Industry and Reflected Great Credit to NASA."

-more-

April 12, 1982

The division's award, accepted by Charles P. Blankenship and Louis A. Teichman, was given for "Outstanding Accomplishments in the Transfer of Materials Technology to the Public Sector, Industry, and Other Government Agencies, Resulting in Significant Benefits to the Recipients and Reflecting Great Credit to NASA."

Wendell W. Kelley, Franklin W. Booth and Dr. Frank Hohl were recognized posthumously for their inventions, and plaques were presented to each of their widows. Kelley's inventions were a velocity vector control system augmented with direct lift control and a pitch attitude stabilization system using engine pressure ratio feedback signals; Booth's was an air removal device; and Hohl's was a large volumn multiple-path nuclear pumped laser.

Other inventors receiving awards were John M. Franke, for a direction sensitive laser velocimeter; Harold G. Bush, for lightweight structural columns; Billy R. Ashworth, Alton C. Hall and Clyde E. Clark, for a helmet weight simulator; Dr. Judd R. Wilkins, for indirect microbial detection; Liam R. Jackson, John P. Weidner, James A. Martin and William J. Small, for an orbiter/launch system;

Stephen C. Irick, for a hydraulic actuator mechanism to control aircraft spoiler movements through dual input commands; Pierce L. Lawing, for a cooling system for high-speed aircraft; Gerald C. Purgold, for an automated syringe sampler; Dr. Harry A. Benz, for an image readout device with electronically variable spatial resolution;

Nelson J. Groom, Dr. Willard W. Anderson and William H. Phillips, for a rim inertial measuring system; Lana M. Couch, for a wind tunnel supplementary mach number minimum section insert; Robert A. Bruce, for an air removal device;

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and Reid A. Hull, for a moving body velocity.

Anne K. and Dr. Terry L. St. Clair received a plaque for their invention of aluminum ion-containing polyimide adhesives. Dr. St. Clair also received an award for a tackifier for addition polyimides containing monoethylphalate.

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Release No. 82-24

LANGLEY RESEARCHER NAMED A TOP YOUNG FEDERAL EMPLOYEE

Hampton, Va. -- A researcher at NASA's Langley Research Center, Hampton, Va., has been named as one of 10 outstanding young federal government employees of 1981.

Dr. Joseph S. Heyman will be presented the Arthur S. Flemming Award April 23 by the Downtown Jaycees of Washington, D.C.

Heyman, a section head in the Instrument Research Division at Langley, was cited for advancing the science of physical acoustics, especially important in measuring the stress tolerance of a wide variety of materials, at critical points, without harm to the material. Specifics include developments in bolt stress instrumentation that resulted in greater safety for fasteners in aircraft, spacecraft and mine structures.

Heyman was also cited for transferring this technology from the laboratory, not only for use within NASA but for other organizations, to solve applications problems in diverse areas from earthquake monitoring to blood clot detection.

Other contributions listed for 1981 were strong leadership of his research group, stimulating students to honors achievements in a research curriculum, and for significant help in fostering a community awareness of man, his technology and directions for the future (through the NASA/College of William and Mary

- more -

April 16, 1982

lecture series, "Our Future in the Cosmos").

This is the 34th year that The Downtown Jaycees have presented the Flemming award to recognize those who have performed outstanding and meritorius work for the federal government. A distinguished panel of judges from industry and government made the selections.

Dr. Arthur S. Flemming, for whom the award is named, has held a number of federal positions, including director of the Office of Defense Mobilization, secretary of the Department of Health, Education and Welfare, the National Advisory Committee of the Peace Corps, U.S. Commissioner on Aging and, most recently, chairman of the U.S. Commission on Civil Rights. Flemming has also served as president of Ohio Wesleyan University, University of Oregon and Macalester College.

The Flemming award will be presented to Heyman at an awards luncheon in Washington, D.C.

A native of New Bedford, Mass., Heyman graduated from Tabor Academy in 1961. He attended Cornell University and Northeastern University, Boston, where he received a bachelor of arts degree with honors in physics in 1968. He earned master of arts and doctorate degrees from Washington University, St. Louis, in 1971 and 1975, respectively. In 1979 he was appointed adjunct professor of physics at the College of William and Mary.

Heyman began his NASA career as a cooperative education student in 1964. He is a research physicist and head of the Materials Characterization Instrumentation Section, where he coordinates a basic research program in ultrasonic (very high acoustic frequency) interactions in materials and a program of applications of ultrasonic techniques to materials physics, solid state physics and electronic materials.

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Over the past 10 years, Heyman has promoted an increased awareness of the need for understanding non-destructive evaluation for materials and structures, with an ultimate goal of extending their "safe" life. Such a science base could prove invaluable in operational monitoring of space platforms, for instance.

The author or co-author of more than 100 publications and presentations, Heyman holds seven patents with four additional pending. He has received numerous awards for his research, including the IR-100 award, which is presented by Industrial Research Development Magazine for each of the 100 most significant technical developments of the year. Heyman is the first person in the history of the award to receive four IR-100s, for the years 1974, 1976, 1978 and 1981. He was presented a NASA Exceptional Service Medal in 1979 and, earlier this month, was presented a Langley Technology Transfer Award.

He is a member of Sigmi Xi, American Physical Society, American Association for the Advancement of Science, Society of Experimental Stress Analysis, and the Institute of Electrical and Electronics Engineers, Sonics and Ultrasonics.

Heyman is married to the former Berna Judith Levine and has one daughter, Laura Dawn. They reside in Williamsburg, Va.

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RELEASE NO. 82-26

MOSS WINS FLOYD L. THOMPSON FELLOWSHIP

Hampton, Va.--Dr. James N. Moss, an aerospace technologist at NASA's Langley Research Center, is the 1982-83 recipient of the Floyd L. Thompson Fellowship.

The Thompson Fellowship Program was established in 1977 to encourage the development of research potential among the Langley staff. The Fellowship allows researchers who have demonstrated continued growth in research to spend up to 12 months at an educational or research institution. It is named in memory of Dr. Floyd L. Thompson, Langley Director from 1960 to 1968. Thompson joined the Langley staff in 1926, retired in 1968 and was a consultant to the NASA Administrator until January 1973.

Moss, the ninth Langley researcher to participate in the Thompson Fellowship Program since its inception, will spend one academic year at the University of Sydney in Sydney, Australia, conducting a numerical study to better define the aerothermodynamic characteristics of vehicles in the low-density flow regime.

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April 23, 1982

Moss said this will be accomplished by applying the direct-simulation Monte Carlo method as developed by Professor Graham A. Bird of the University of Sydney. According to Moss, this solution method is the only rigorous and practical method for calculating transitional flow problems but has been rarely used.

"The research will support the Aerothermodynamics Branch's expanding program to develop computational methods for defining the aerodynamic and aerothermodynamic environment about entry vehicles in the transitional flow regime," Moss explained. "This cooperative research with Professor Bird should advance our program in aero-assist aerothermodynamics which is urgently needed for the development of orbital transfer vehicles."

Moss said he is very pleased with being selected as a Thompson Fellow. "I anticipate that a year of concentrated research on this problem will be interesting and challenging and will enhance Langley's ability to predict the performance of candidate aero-assist vehicles."

Moss began his NASA career in August 1962 as an aerospace technologist in the Structures Division. From October 1970 to August 1974 he was assigned to the Materials Division. In August 1974 Moss began his present work in the Space Systems Division, conducting studies of the flow field and heating environment encountered by the Galileo Probe, a proposed Titan aerocapture vehicle and the Space Shuttle Orbiter. He has specialized in numerical computations, reacting flow fields, turbulence, radiation transfer and effects of transpiration cooling.

A native of Tennessee, Moss graduated from DeKalb High School in Smithville in 1958. He earned a bachelor of science degree in engineering science from Tennessee Polytechnic Institute in 1962. He received a master of science degree

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and a doctorate in aerospace engineering from the University of Virginia in 1968 and from Virginia Polytechnic Institute and State University in 1972, respectively.

The author or co-author of over 60 technical papers and reports, Moss is a member of the Virginia Academy of Science and the American Institute of Aeronautics and Astronautics.

Moss and his wife, Nina, live in Grafton with their three children.

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RELEASE NO. 82-28

SWAIN NAMED A NASA-LANGLEY DIRECTOR

Hampton,Va.--Robert L. Swain has been selected as Director for Systems Engineering and Operations at NASA's Langley Research Center in Hampton, Va. Swain, former Manager of the National Transonic Facility Project Office, replaces E. Barton Geer, who retired last December.

As Director for Systems Engineering and Operations, Swain manages the activities of the Fabriaction Division; Systems Engineering Division; Facilities Engineering Division; Operations Support Division; National Transonic Facility Project Office; Systems Safety, Quality and Reliability Office; and the Facilities Program Development Office.

These organizations are responsible for the services required to support the center's research programs and institutional plant, including the construction of facilities program, mechanical and electrical systems, complex research facilities, equipment and test apparatus; complex aerospace systems and research test articles; comprehensive safety, quality and reliability program, energy conservation and

-more-

April 27, 1982

environmental compatibility program and institutional buildings, structures and grounds maintenance.

Swain began his NASA career as an aerospace technologist in May 1955, specializing in chemical propulsion research and development, launch vehicle propulsion, arc-powered wind tunnel and materials research. In 1962 he was named Head, Rocket Group; in 1964 Assistant Head, High Temperature Materials Branch; and in 1966 Head, Propulsion Branch. In 1970 he was named a Sloan Fellow at the Massachusetts Institute of Technology in Boston, Mass.

Upon his return to Langley in 1971, he became Assistant Chief of the Atmospheric Environmental Sciences Division, where he assisted in formulating, developing and managing basic and applied research in the physics, composition, structure, and properties of the Earth's atmosphere, both natural and as impacted by man's activities.

In December 1979 he was named Chief, Systems Engineering Division, the organization responsible for advancing and applying engineering technology to the design, development, and manufacture of aeronautical and spaceflight systems and ground-related facilities in the aerospace field.

As Manager of NTF since March 1981, Swain provided overall technical and managerial direction for center activities relating to the design, construction, operational shakedown and activation of a major new national high Reynolds wind tunnel costing over $85 million and using cryogenic nitrogen (minus 300°F.) as the test medium. When the NTF becomes operational for research testing in late 1982, it will provide NASA, DOD and the aerospace industry the capability of testing small models of advanced commercial and military aircraft under aerodynamic conditions simulating full-scale flight.

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Born in Memphis, Tenn., Swain graduated from Lanier High School in Macon, Ga. He received a bachelor of science degreee in chemical engineering from the Georgia Institute of Technology in 1954. He received a master's degree in management from the Massachusetts Institute of Technology in 1971. While at MIT, he received the Brooks Prize for the Outstanding Thesis of the Sloan School of Management.

The author or co-author of many technical papers, Swain holds a patent on a spherical rocket motor, which has been widely applied in the space program. He is a member of the American Institute of Aeronautics and Astronautics and was Chairman of Langley's Combined Federal Campaign for 1980-81.

Swain and his wife, Sandra, live in Newport News, Va. They have a daughter and a son.

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RELEASE NO. 82-33

SCIENTISTS GATHER TO EXCHANGE INFORMATION ON LOWER ATMOSPHERE

Hampton, Va. -- Scientists representing government agencies and universities from around the world will meet in Williamsburg, Va., beginning May 25 to review recent studies of the lower atmosphere.

The "Second Symposium on the Composition of the Non-urban Troposphere" is cosponsored by the American Meteorological Society, the American Geophysical Union and NASA. Program coordinator is Dr. Jack Fishman of NASA's Langley Research Center, Hampton, Va.

Studies singled out for the four-day symposium focus on the non-urban troposphere, where 80 percent of Earth's atmosphere is concentrated and where most weather effects take place. It is a relatively narrow zone which extends outward about 11-16 kilometers (7-10 miles) from the Earth's surface. The non-urban troposphere includes rural, mountain, ocean and other geographic areas.

More than 100 technical papers will be presented on a wide range of topics including interpretation and significance of the composition of the non-urban troposphere, background and non-urban measurements of tropospheric gaseous and aerosol species, and other related subjects.

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May 12, 1982

A special issue of the Journal of Geophysical Research, published by the American Geophysical Union, will reprint the papers presented at the meeting.

The study of the composition of the non-urban troposphere is relatively new. Before the early 1970's scientists believed that the chemical composition of that area was constant and could not be altered significantly by human activity.

Recent studies, many of which will be presented in Williamsburg for the first time, have shown that a significant change in the composition of the non-urban atmosphere may have occurred since the beginning of the industrial era (about 1900). These inferences have been drawn from new information which shows considerable differences in the composition of the Northern and Southern Hemispheres. Whether or not such differences can be attributed to the fact that 95 percent of man's industrialized activities take place in the Northern Hemisphere will be discussed at the symposium.

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RELEASE NO. 82-34

AEROSPACE MATERIALS WORK FOR HANDICAPPED

Hampton, Va.--Graphite filaments 10 times finer than a human hair, developed by NASA for advanced aircraft and spacecraft materials, are finding their way into down-to-Earth devices to improve the lives of handicapped people.

These strong, stiff and lightweight materials are relatively expensive, so they aren't likely to be widely used in consumer products. They may be ideal, however, for some highly tailored needs of the handicapped.

The graphite filaments -- no more than six microns (4/10,000 of an inch) in diameter -- are so small that an individual strand is barely visible to the unaided human eye. Multiplied by thousands and impregnated with a glue-like resin, the filaments become an extremely strong composite material that can be molded into any shape and can be worked by filing, cutting or drilling.

These qualities, plus a weight approximately half that of aluminum, make new composites the same excellent structural materials for leg braces, walkers and wheelchairs as they are for airplane tail sections and wing control surfaces.

NASA's Langley Research Center, Hampton, Va., a leader in composite material research and a pioneer in the use of lightweight composites, is transferring the

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May 11, 1982

technology to biomedical uses.

Langley's expertise was first requested in 1975 to build a set of leg braces for a crippled 17-year-old girl at the Coastal Center State Department of Mental Retardation at Ladson, S.C. She was unable to walk with her heavy stainless-steel and aluminum braces.

"We were a logical place to turn," says Langley researcher Robert Baucom. "We replaced several of the brace's metal supporting members with composite members fabricated in Langley's model shop. The braces were then considerably lighter and allowed the girl to ambulate -- move around under her own power -- as opposed to being a near-invalid.

"This simple, but important, savings of weight through the use of composites has been the thrust of most of our branch's work in the biomedical area," explains Baucom.

A member of the Materials Processing and Applications Branch at Langley, Baucom spends most of his time with aerospace research, but he occasionally finds time to honor requests to do work he obviously loves.

In the seven years since the first request, Baucom has made several test items from composites. Once a concept is successfully demonstrated, private companies are contacted and encouraged to make the product or service available to the general public.

Requests for support generally come through Langley's Technology Utilization Office from hospitals or other medical institutions. Baucom's work in materials is one of about a half-dozen disciplines at Langley that support medical aerospace "spinoffs."

Baucom's latest biomedical project is aimed at using composites to lighten the load for wheelchair users, especially if they have to load and unload the

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chair themselves. Encouraged by his first experience in this area several months ago -- he fabricated an extremely portable and lightweight inflight wheelchair intended for use aboard airliners -- he now heads a government-university research team creating what will be one of the first general-purpose wheelchairs made with composites.

Work on the general purpose chair is based on a unique design by the University of Virginia Rehabilitation Engineering Center. Structural analysis is being performed at Langley using NASA computer programs and personnel from Drexel University, Philadelphia.

The University of Virginia center, part of UVA's hospital complex, will perform clinical evaluations on two of three prototype wheelchairs to be made this fall and winter as a result of the project. One of the two will be tested in actual operating conditions outside the medical center and one will be tested in the UVA hospital by patients and others who understand problems of the handicapped. The third chair will undergo lab tests at UVA and NASA for fatigue, structural strength, rolling resistance and a number of other criteria. The UVA work is being funded by the National Institute of Handicapped Research, part of the National Institute of Health.

The major structural members of the prototype wheelchairs will be fabricated from a Kevlar and graphite composite. Such a composite is corrosive resistant and damage tolerant with excellent fatigue characteristics, according to Baucom, who believes a chair made with the material will also prove to be cost competitive. Design weight is about 55 kilograms (25 pounds), compared to about twice that for a comparable metal wheelchair.

"In the long run, everybody will benefit from this type of research," says John Samos, head of Langley's Technology Utilization and Applications Program

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Office. "It will reduce medical costs and provide new business opportunities. A number of new companies have been formed just to market products resulting from NASA technology."

Samos oversees a biomedical applications team that identifies NASA technology that "might improve upon a medical product or procedure or offer a solution to a problem."

"In the materials area," says Baucom, "even though the total effort has been small over the years, I think we've made significant contributions," including:

- A composite foot support for stroke victims who otherwise might drag the toes of the affected foot and trip. The device, a reinforced shell fitted under the calf, heel and foot almost to the toes, is stronger and stiffer than earlier versions. Older foot supports measured up to a third of a centimeter (1/8-inch) thick and often required the user to buy two pairs of shoes, one a size larger to accommodate the device. Because the composite foot support is very thin, only one shoe size is normally required.

- An 11-year-old boy from Newport News, Va., born with an abnormality which caused one leg to be 15 cm (6 in.) shorter than the other, wore out aluminum shoe extensions at the rate of one every two or three months. Baucom built a graphite/epoxy extension that the active boy wore until he outgrew it two years later. He then received a new set: one extension for everyday wear, one for dress.

- A professor at American University in Washington, D.C., had extreme difficulty handling the weight of her steel and aluminum stairway walker. Three-quarters of the walker was replaced with composites, making it about 50 percent lighter. The change significantly improved her mobility and independence, and she soon made a solo trip to Europe.

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• A little clip made of composite material may someday be surgically implanted in people with aneurisms, a disease that causes blood vessel walls to become thin and expand like a balloon. A small stainless-steel clip is inserted at the base of the balloon-like area to relieve pressure, but it blocks x-ray monitoring of healing; the composite will not. Baucom has applied for a patent on the device, and is convinced it will work and be biocompatible.

Perhaps the most satisfying moment Baucom has experienced because of his work with the handicapped come when he met a person who was using a Langley-designed item.

"He had difficulty talking, but when the nurse pointed out I was responsible for helping make the protective device he was wearing, it was clear that he was pleased by the look on his face. I experienced a heavy sense of elation at that point, feeling I had contributed something."

The young man, a resident of the Southeastern Virginia Training Center in Chesapeake, Va., has epilepsy. Subject to an occasional seizure, he sometimes falls and has been seriously injured several times.

A conventional protective face mask/helmet combination -- similar to those worn by football linemen -- is so heavy and awkward for a physically impaired person that residents of the center often refuse to wear them.

Baucom replaced the helmet's face mask, a gridwork of steel bars attached to the front of the leather helmet, with a molded mask made of kevlar/epoxy composite that weighs only 84 grams (three ounces). Baucom says the new mask "has offered all the protection required for he young man and he freely wears it."

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Reviewing the biomedical products of Langley's expertise in processing aircraft composites, Baucom says, "I think this work represents some of the best-spent money at Langley, considering the very positive feedback we've received from an almost insignificant effort. I'd do it full time if I could."

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(NOTE: NASA-Langley Photo L-81-8727 is available to accompany this release and will be provided by phoning Keith Henry at (804) 827-2934/3966. Please specify black and white or color.)

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RELEASE NO. 82-37

COLE'S ENERGY IDEA SAVES NASA-LANGLEY MONEY

Hampton, Va.--Differential temperature controllers for electrical heaters, installed in drive motors at 11 major tunnels, saved NASA's Langley Research Center approximately $46,000 last year.

The energy saved by using the controllers, which were suggested by Kenneth N. Cole, Assistant Chief of the Operations Support Division, led to the $1,735 Energy Suggestion Award that he recently received.

"Cole's idea was really quite simple," said Irvin Hamlet, Chairman of Langley's Energy Savings Committee, "but it has a substantial energy impact, one which amounts to two million kilowatt hours annually."

Hamlet explained that electric resistance heaters are installed in the drive motors at Langley's wind tunnels to prevent problems from moisture and condensation within the motor. In the past when the motor was not operating, the electric heaters remained on, using a very large amount of electricity. The only time the heaters were not on was when the drive motor was in operation to drive the wind tunnel. "Cole's idea was to install simple differential temperature controls to turn on the electric heaters only when necessary, and thereby saving vast amounts

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of electricity," Hamlet said. "The heaters now come on only when needed to maintain a slightly higher temperature inside the motor than outside, thus preventing condensation."

"Cole's suggestion was first tested at the Transonic Dynamics Tunnel to verify that it did, in fact, result in substantial energy savings," Hamlet added. Controllers have now been installed at the 16-Foot, Unitary, 8-Foot, 30- by 60- Foot and 4- by 7-Meter tunnels, for example, where there are large drive motors.

Cole noted that solid-state circuitry components were purchased and the controllers were installed in-house. The implementation cost at all sites totaled $20,000.

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Release No. 82-39

"SLIPPERY" WINGS SMOOTH WAY FOR BUSINESS PLANE FUEL SAVINGS

Hampton, Va. -- An aerodynamics advancement once thought to be impractical for powered aircraft may be practical after all, according to evidence gathered by a research team at NASA's Langley Research Center.

The smooth and aerodynamically clean lines of many airplanes developed since World War II may offer previously unrecognized advantages in performance and fuel efficiency that many older aircraft, with their protruding rivets and surface imperfections, cannot easily match.

The advantage results from a phenomenon called laminar flow. An airplane which achieves laminar flow can slip through the air with less effort, which can either increase speed or save fuel. Airflow close to the surface of a wing or other smooth object is called laminar when its layers are thin and uniform and slide easily over each other, delaying the onset of drag-producing air turbulence.

Considered an intriguing opportunity as a result of wind tunnel and flight tests in the 1930s and 1940s, natural laminar flow proved to be extremely difficult to achieve on conventional, riveted aluminum airplane designs. After several attempts by powered airplane manufacturers to capitalize on laminar flow, interest faded.

Unpowered sailplanes, however, had been exhibiting natural laminar flow

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at cruise speeds approaching that of powered light planes for some time. Sailplanes slice through the air efficiently because their shapes are aerodynamically good, and because they are made with plastic-like composite skins of fiberglass or kevlar which can eliminate waviness, rough body joints and other obstructions which destroy laminar flow.

Researchers at Langley recently predicted that modern construction techniques, developed since the early NACA tests, now allow full-sized wings to be built that approach the smoothness of highly accurate wind tunnel scale models and flight test wings that demonstrated laminar flow 40 to 50 years ago. In the past several months, flight tests have been conducted which substantiated these predictions.

"I think many people will be surprised at our findings," said Dr. Bruce Holmes, of Langley's Subsonic Aerodynamics Branch and one of several researchers on the project. "While Langley had a clean-looking, full-size lightweight airplane made of fiberglass in the 30-by-60-Foot Tunnel last year, several of us thought it a good opportunity to check for laminar flow. We put chemicals on all the wing surfaces, allowing us to visually determine the extent of laminar flow. The flow proved to be laminar on the lifting surfaces studied in the tunnel.

"That's when we took it a step further and tested eight actual flying aircraft, ranging in size from small two-place, propeller-driven home-built airplanes up to a twin-engine business jet. All were aerodynamically efficient aircraft, and the flight tests proved that a significant part of their efficiency was due to the achievement of laminar flow, reducing drag by an estimated 25 percent in some cases.

Making use of construction methods developed since the 1950s, these airplanes have either bonded wing skins made of aluminum, integrally stiffened milled skins of aluminum or skins made of composites. Beneath the skins, wing substructures can vary greatly and represent another important area of advances.

As a result, wing construction techniques have changed enough since the early wind tunnel work to allow modern wings on general aviation airplanes to achieve laminar flow.

Applications could go beyond the smallest of airplanes to business transports and commuter airliners, provided some crucial operational problems can be solved. For example, small amounts of ice buildup could cause large increases in drag on laminar flow wings.

More pervasive is the possible disturbance of the airflow by insects. "Wherever insects hit and stick, they may interfere with the smoothness of the boundary layer (of air). What you want to do is to keep ice and insects from sticking in the first place," Holmes says. Rain can temporarily do the same thing, as proven in flight and in wind tunnels. Tests are planned during the next year to evaluate concepts intended to eliminate ice and insect-sticking problems on laminar flow wings.

The additional effort to keep wings and other lifting surfaces clean should be worthwhile. The payoff in fuel efficiency promises to be high. About half of the total drag on an airplane at cruise speeds is caused by friction between the air and the airplane skin surface. Explains Holmes: "That friction can be very low with laminar flow. However, if the flow is turbulent, that friction can be as much as seven or eight times greater."

Taking full advantage of maximum laminar flow will probably require new airplane designs, according to Holmes, because the same slippery qualities that can make wings aerodynamically efficient can be applied to the fuselages of

- more -

certain designs as well.

In spite of the challenges that remain, Holmes and others at Langley are excited about documenting the possibilities of natural laminar flow on "real airplanes that fly in the real world."

"It's also been fun," muses Holmes, "for us to work in a classical research area that Langley pioneered."

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RELEASE NO. 82-40

COPELAND NAMED ASSISTANT CHIEF OF NASA-LANGLEY DIVISION

Hampton, Va.--Carl E. Copeland, former Head of the Electronic Technology Branch is the new Assistant Chief of the Fabrication Division. He replaces James L. Miller, who retired last September.

Copeland assists the division chief in planning, developing, directing, programming and evaluating technical services to build research test models and associated systems and equipment in support of Langley projects and program requirements; develops and manages the division's Institutional Management System (IMS); and participates in the overall administration of contracted services, including metal, wood, composite, electronics and fabrication support contracts. He is responsible for the continuing development of processes, procedures and programs for improving fabrication methods and practices, including effective and efficient use of numerical-controlled machining system and computer-aided fabrication equipment.

Copeland began his career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in December 1947 as an apprentice electronic instrument maker. Since graduating from the Langley Apprentice School in 1952, he has been an electronic technician, a supervisory electronic technician, Head

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of the Electronic Fabrication Development Section and Head of the Electronic Technology Branch.

Before joining Langley, Copeland served in the U.S. Navy and worked at the Newport News Shipbuilding and Dry Dock Company.

Copeland has made many significant contributions, including electronic fabrication of Viking Flight Hardware and extending the state-of-the-art in microelectronics technology by developing Langley crystal growth ability. He has received three Special Achievement awards and many certificates of recognition for outstanding service.

A native of Hampton, Copeland lives in Yorktown with his wife, Flossie. They have two children.

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RELEASE NO. 82-43

NASA RESEARCHER CITED BY HAMPTON INSTITUTE

Hampton, Va.--Christine M. Darden, an aerospace engineer in the High-Speed Aerodynamics Division at NASA's Langley Research Center, has been presented the Outstanding Twenty-Year Alumnus Award from Hampton Institute.

Darden was cited for her distinguished achievements in the fields of mathematics and engineering, as well as significant contributions to better the quality of life in her community.

Presenting the award during commencement exercises May 16, Dr. William R. Harvey, President of Hampton Institute, recognized Darden by saying, "You are a trailblazer in a field dominated by men. Langley Research Center presented you an Outstanding Service Award and you were cited as an Outstanding Woman of America in 1975. Your community affiliations are legion....Christine Mann Darden, educator, scientist, community leader, ardent church worker, aerospace engineer and loyal Hamptonian, Hampton Institute honors you today....Accept my warmest congratulations."

Darden received a bachelor of science degree in mathematics and a minor in physics from Hampton Institute in 1962 and a master of science degree in

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mathematics from Virginia State College in 1967. She has completed doctoral graduate work at both the University of Virginia and the College of William and Mary. She is enrolled in the School of Engineering and Applied Science at George Washington University and is a candidate for a doctor of science degree in the Department of Mechanical Engineering.

Darden joined the research staff at Langley in June 1967 as a data analyst. In her present position since June 1973, she conducts research in analytical methods used in the study of supersonic aerodynamics.

Before coming to Langley, Darden was a mathematics instructor at Virginia State College and did aerosol physics research at that institution.

The author or co-author of numerous technical papers, Darden is a member of the American Institute of Aeronautics and Astronautics, Vice President of the Hampton Roads Chapter of the National Technical Association and is a member of many local and national organizations. She is listed in the 1980 edition of Who's Who Among Black Americans.

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RELEASE NO. 82-44

NASA LANGLEY EMPLOYEES TO PRESENT PAPERS AT PROPULSION CONFERENCE IN CLEVELAND

Hampton, Va.--Nine NASA Langley Research Center employees will participate in the 18th National Joint Propulsion Conference next week in Cleveland, Ohio.

Dr. John S. Mixson, Dr. Fereidoun Farassat and Dr. Jack Leatherwood, Acoustics and Noise Reduction Division; Charles Mercer and Laurence Leavitt, Transonic Aerodynamics Division; James Martin, Space Systems Division; and Scott Thomas, Robert Guy and Ernest Mackley, High-Speed Aerodynamics Division, will present papers at the three-day conference, June 21-23. The conference, which includes 54 technical sessions with 275 papers being presented, is sponsored by the Northern Ohio Section of the American Institute of Aeronautics and Astronautics and the Cleveland Chapters of the Society of Automotive Engineers and the American Society of Mechanical Engineers.

The conference brings together over 600 technical professionals and key management representatives from worldwide organizations engaged in research and development; manufacture; and application of propulsion systems for aircraft, space, surface and marine vehicles. NASA's Lewis Research Center in Cleveland also plays an integral part in this year's conference.

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The welcoming address will be given by Dr. Reuben F. Mettler, Chairman of the Board and Chief Executive Officer of TRW, Inc., and the keynote address will be by U.S. Senator John Glenn of Ohio. Glenn will be honored for the 20th anniversary of the first U.S. orbital flight. James Beggs, NASA Administrator, will be the speaker at the awards luncheon.

General Co-Chairmen are Dr. John F. McCarthy, Jr., Director of Lewis, and Bruce H. Pauly, Vice President, Engineering and Research, Eaton Corporation. Langley's James Martin is a member of the Program Committee.

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RELEASE NO. 82-45

BRECKENRIDGE TO PARTICIPATE IN NASA PROGRAM

Hampton, Va.--Dr. Roger A. Breckenridge, Head, Information Systems Research Branch, Flight Electronics Division, at NASA's Langley Research Center in Hampton, Va., has been selected to participate in the 1981-82 Senior Executive Service (SES) Candidate Development Program at NASA Headquarters in Washington, D.C.

The year-long program provides NASA with highly qualified candidates for competitive SES positions. The nominees have high potential for entry into SES after they complete the program. Breckenridge is one of six participants from throughout NASA.

He will report to Headquarters in September, where he will work as deputy to Lee Holcomb, Head of Information Systems in OAST's Space Systems Division.

Breckenridge began work at Langley in early 1962, investigating radiation defects in solids and radiation effects in semiconductor devices. He became leader of a group studying radiation effects in electronic components and optical materials in 1966.

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He was named Head of the Electronic Components and Devices Section in 1969, Assistant Head, Information Systems Research Branch, in 1977, and began his present job in 1980.

Breckenridge earned a bachelor of science degree (with distinction) in physics from the University of Oklahoma in 1961. He received a master's degree in physics in 1967 and a doctorate in solid state physics in 1974, both from the College of William and Mary.

He is the author or co-author of 18 technical publications. He is a member of the American Physical Society, and he has received an Outstanding Achievement Award for his work in the development of electronic devices.

He and his wife, Vivian, live in Newport News with their two children.

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RELEASE NO. 82-48

NASA-LANGLEY SELECTS EQUIPMENT CONTRACTOR

Hampton, Va.--Foster-Wheeler Energy Applications, Inc., Livingston, N.J., has been selected for negotiation of a contract to build a high-pressure, L-shaped, water vessel for NASA's Langley Research Center.

The vessel will be used to store water for the Aircraft Landing Dynamics Facility. The facility uses a water jet system to propel a test carriage equipped with landing gear along a rail/track system under simulated runway conditions. These tests enable Langley engineers to do research on aircraft and spacecraft landing gear.

The firm-fixed-price contract is valued at approximately $1.5 million.

Under the terms of the contract, fabrication would be done at the firm's plant in New Jersey, starting in early August, with assembly and installation to be done at the Langley Research Center.

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June 25, 1982

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Release No. 82-49

NEW EVIDENCE MAY FORCE RETHINKING EVOLUTION OF ATMOSPHERE, LIFE

Hampton, Va. -- Theoretical computer calculations, based in part on measurements of "young" stars obtained with an orbiting telescope, may require a reexamination of some of the basic ideas about the composition of Earth's early atmosphere and the origin of life.

Astronomical measurements indicate that considerably more ultraviolet radiation may have been emitted by the young Sun, compared to that emitted by the present Sun. Therefore, high levels of such radiation from the young Sun, potentially harmful to life, would have been striking the Earth at the very time life was being formed.

This intriguing conclusion is the result of work by researchers from three NASA field centers: Goddard Space Flight Center, Greenbelt, Md.; Goddard Institute for Space Studies, New York; and Langley Research Center, Hampton, Va.

Recent photochemical calculations by atmospheric researchers at Langley were presented at an international scientific conference last fall and published in journals this spring. They state that, at the time complex organic molecules (the precursors of living systems) were first formed from atmospheric gases, the Earth's atmosphere was not composed primarily of methane, ammonia and hydrogen as was previously supposed. Instead, it was composed of carbon dioxide,

- more -

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nitrogen and water vapor, all resulting from volcanic activity. Langley calculations indicate that both methane and ammonia were extremely shortlived, and that such an atmosphere was photochemically unstable if it existed at all.

That alone has far-ranging implications to those who study the chemical evolution of the atmosphere and the origin of life on our planet.

Being familiar with this recent Langley work, Dr. Vittorio M. Canuto asked Langley to help assess his theory about ultraviolet radiation. Canuto, a theoretical astrophysicist at Goddard Institute, theorized that the emission of ultraviolet radiation varied during the history of the Sun, and was probably many times greater during the Sun's first billion years (the Sun and the Earth are about 4.5 billion years old).

Shortly after connecting with Dr. Joel S. Levine and others in the Atmospheric Science Divison at Langley, Canuto learned of new measurements obtained with the International Ultraviolet Explorer, a satellite launched in 1978 used alternately by NASA and the European Space Agency for studies of ultraviolet radiation emitted by stars and galaxies. This ultraviolet radiation is absorbed by ozone in the Earth's upper atmosphere and, hence, is not detectable by ground-based telescopes.

Observational astronomer Dr. Catherine L. Imhoff, of Computer Sciences Corp. at Goddard, recently measured ultraviolet radiation from a half-dozen young Sun-like stars (less than one billion years old) which indicated that these stars were emitting orders of magnitude more ultraviolet radiation than was previously believed.

The result was a pooling of minds and resources and enough new data to conclude that:

o Ultraviolet radiation at the Earth from the young Sun may have been up to 100,000 times greater than today. The previous assumption was that ultraviolet

- more -

radiation from the young Sun was roughly comparable to today's levels.

o Oxygen in the Earth's early atmosphere may have been at least one million times greater than anyone ever thought. Scientists generally have believed that virtually no oxygen was in the atmosphere at the time life evolved. The primary mechanism for producing oxygen in the prebiological early atmosphere was the break up of the molecules of water vapor and carbon dioxide -- resulting from volcanic emissions -- by ultraviolet radiation from the young Sun. (In today's atmosphere, oxygen -- produced entirely by photosynthetic activity -- is the second most abundant gas with a mixing ratio of 0.21, or 21 percent.)

o Higher levels of oxygen meant higher levels of atmospheric ozone, necessary for shielding the surface of the Earth from lethal ultraviolet radiation; although the Langley calculations indicate that levels of ozone in the early atmosphere were not enough to protect the surface of the Earth from enhanced levels of solar ultraviolet radiation.

"Proving this scenario," says Levine, "is difficult. Many of the figures we used for our computer simulations are conservative. Our earlier predictions of the composition and evolution of the atmospheres of Mars and Venus obtained with similar computer models -- before we actually sent probes to measure firsthand -- proved about 90 percent accurate. Of course, the composition of the early atmosphere has not been directly measured, as have the atmospheres of several of the planets.

"In the case of our calculated oxygen levels, one bit of evidence from the early geological record supports our conclusion. It was puzzling, but geologists know from their analyses of the oldest known rocks, that the oxygen level of the early atmosphere had to be much higher than previously calculated. Analyses of these rocks, estimated to be more than 3.5 billion years old, found oxidized

- more -

iron in amounts that called for atmospheric oxygen levels to be at least 100 times greater and perhaps up to one billion times greater than otherwise accepted.

"We don't know how the presence of free oxygen may have affected the chemical evolution process; that is, the formation of complex organic molecules from atmospheric gases, but high levels of ultraviolet radiation must have had a very important impact on the origin and evolution of life.

"The implications of all this are profound. First, high levels of ultraviolet radiation are lethal to living systems as we know them. How could life have formed and evolved in such a hostile environment? According to our calculations, there was virtually no ozone in the early atmosphere to protect against ultraviolet radiation levels that were much greater than they are today. It clearly should have affected the evolution of life on Earth.

"Second, the overwhelming majority of chemical evolution experiments since the first in 1952 may have been conducted with the wrong atmospheric mixture. Also, none of the experiments included oxygen, which we believe was present at least in small quantities. Even a small amount of a particular gas, once it reaches a certain level, is potentially important. There are a number of examples in today's atmosphere where gases at the parts-per-billion level are environmentally and chemically significant."

For Langley's contributions to the present study, Drs. Levine, Tommy R. Augustsson, a NASA-National Research Council research associate, and Murali Natarajan, of Systems and Applied Sciences Corp., collaborated, using several theoretical computer models orginally developed to study the impact of man's activities on the future composition and chemistry of the atmosphere.

"Now," Levine explains, "we're running the programs back in time. With Canuto and Imhoff's help, we're studying the early history of the Earth's atmosphere at the time life formed. That's important, because by understanding how the atmosphere evolved over geological time, we can better understand the future state of the atmosphere and better assess the role of man's activities.

"Not only are we using the theoretical computer models of the early atmosphere, we're using measurements from a telescope in space. We're applying those measurements to a study of the Earth's early atmosphere and the evolution of life -- perhaps the last thing people thought those measurements would be used for -- and we're coming out with a whole new scenario that's going to cause a reexamination of the chemical and biological processes that led to the origin of life on Earth."

These new ideas about the composition and evolution of the early atmosphere are reported in a series of recently published papers in Nature (April 29, 1982), the Journal of Molecular Evolution (May 1982) and Origins of Life (June 1982).

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RELEASE NO. 82-72

NASA-LANGLEY APPRENTICES TO GRADUATE

Hampton, Va.--Twenty-four Langley Research Center apprentices will receive their journeyman certificates Friday, October 8, at the 38th Annual Completion Exercises for Engineering Technicians.

The ceremony will begin at 1:30 p.m. in the Activities Center, Building 1222.

Norris H. Holt, Virginia State Director of the Bureau of Apprenticeship and Training, U.S. Department of Labor, will be the keynote speaker.

Robert M. Connell, Jr., Engineering Technician in the Fabrication Division, will be the speaker for the Class of 1982 and John C. Covington, Administrator of the Engineering Technician Apprentice Program, will present the certificates.

The graduates and their trades are:

Engineering Technicians (Research Facilities Operations), Operations Support Division: Tracy A. Bridges; Phillip L. Brown; Robert A. Edahl, Jr.; Bobby E. Gaddy; Lelon A. Garner; Thomas A. Grepiotis; John H. Grosvenor, and Karen S. Whitley.

Electronics Technicians, Instrument Research Division: Kenneth H. Cate; Stephen B. Jones; Bradley D. Leighty; and Patricia A. Paulin.

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October 5, 1982

Engineering Technician (Mechanical Development), Fabrication Division: Lonnie D. Combs.

Engineering Technician (Aerospace Model Development), Fabrication Division: Robert M. Connell, Jr.

Electronics Technicians, Flight Electronics Division: Ronald A. Dunn; Stephen L. Ruggles; and Robert W. Wills.

Electronics Technicians, Analysis and Computation Division: Louis D. Galland and Lindsey W. Lowe.

Electrical Engineering Technician, Operations Support Division: James M. Howard.

Electronics Technicians, Fabrication Division: Walter B. Mitchell; Richard P. Paquin; and William M. Vance.

Engineering Technician (Fabrication Development), Fabrication Division: Kim F. Schroeder.

Holt has been with the Bureau of Apprenticeship and Training, U.S. Department of Labor, since 1958. He was Apprentice and Training Representative in Washington, D.C., until he assumed his present position in Richmond in 1965.

Previously he completed apprenticeship as an electrician and worked in industry as journeyman, foreman and superintendent for 10 years. He is a member of IBEW 467 and has served in all official capacities of the local including business manager. He served in the U.S. Navy from 1942 to 1945.

Holt, a native of Virginia, attended the Georgia School of Technology and Northwestern University.

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RELEASE NO. 82-73

NASA HONORS EMPLOYEES AT AWARDS CEREMONY

Hampton, Va.--NASA will honor employees who have made outstanding contributions in aeronautical and aerospace research during the past year at the Annual Honor Awards Ceremony at the Langley Research Center Friday, October 22.

James M. Beggs, NASA Administrator, will be the guest speaker for the ceremony, which will begin at 1:30 p.m. in the Activities Center, Building 1222.

NASA awards will be presented to the following:

Outstanding Leadership Medal: Hubert K. Clark; Roy V. Harris, Jr.; and James D. Lawrence, Jr.

Exceptional Scientific Achievement Medal: Gerald M. Keating, James M. Russell III, Terry L. St. Clair and Manuel Stein.

Exceptional Engineering Achievement Medal: John A. Dodgen and William C. Walton, Jr.

Exceptional Service Medal: Beulah C. Baccus, Ernest A. Gurganus, W. Ray Hook, Robert J. Huston, Louis F. Vosteen and E. Carson Yates, Jr.

Group Achievement Award: Advanced Fighter Technology Team, Aircraft Noise Prediction Program Team, Differential Absorption Lidar Experiments Team, Impact-Damage Tolerant Composite Structures Team, IPAD Relational Information Management

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October 15, 1982

Software Development Team, Measurement of Air Pollution From Satellite Experiment Team, and Refuse Consuming Utility Plant Team.

Langley awards will be presented to the following:

H.J.E. Reid Award: Anne and Terry L. St. Clair.

Twenty-five Group Achievement awards will also be presented.

Beggs, the sixth man to head NASA, has been Administrator since July 1981. Previously, he was Executive Vice President, Aerospace, and a director of General Dynamics Corp., St. Louis, Mo. He was responsible for General Dynamics Convair, Electronics, Fort Worth and Pomona Divisions.

He was with NASA from 1968 to 1969 as Associate Administrator, Office of Advanced Research and Technology. From 1969 to 1973 he was Under Secretary of Transportation. He went to Summa Corporation as Managing Director of Operations and joined General Dynamics in January 1974. Before joining NASA, he had been with Westinghouse Electric Corporation for 13 years.

A 1947 graduate of the U.S. Naval Academy, he served with the Navy until 1954. In 1955 he received a master's degree from the Harvard Graduate School of Business Administration.

A member of the Board of Governors of the National Space, the National Security Industrial Association and the American Astronautical Society, his other professional affiliations include the National Academy of Public Administration, the American Institute of Aeronautics and Astronautics, the American Society of Naval Engineers and Sigma Tau.

He holds an honorary LL.D. degree from Washington and Jefferson College, Washington, Pa., and an honorary doctor of engineering management degree from Embry-Riddle Aeronautical University, Daytona Beach, Fla.

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RELEASE NO. 82-74

RCA SELECTED FOR NASA CONTRACT NEGOTIATION

Hampton, Va.--The RCA Service Company, Cherry Hill, N.J., has been selected for negotiation leading to a contract award to provide electronics fabrication support services to NASA's Langley Research Center.

Under the terms of the contract, RCA will provide technical support to fabricate, install and check electronics circuitry. This includes circuit assemblies such as telemetry systems, ground support equipment and facility support instrumentation. RCA will also install, service and check audio communication equipment, closed circuit television equipment and industrial equipment.

The cost-plus-award-fee contract is valued at approximately $12 million, which covers a five-year period.

Most of the work required by the contract will be performed at the RCA plant in Hampton. Some of the work will be done at the Langley center.

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October 15, 1982

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RELEASE NO. 82-75

TROWER TO SPEAK AT NASA LANGLEY COLLOQUIUM

Hampton, Va.--Although the single magnetic charge, called a magnetic monopole, has been the object of numerous searches, research to date has not found any supporting experimental evidence. However, a recent laboratory sighting has provided fuel to magnetic-monopole theories.

Dr. W. Peter Trower, nationally recognized physics expert, will speak as part of the Langley Colloquium Series on "The Search for the Magnetic Monopole" at 2 p.m. on October 25 at the Activities Center. A news briefing will precede the lecture at 1:15 p.m.

One of the most exciting aspects of Trower's lecture is that it closely follows a recent observation by Blas Cabrera of Stanford University of a laboratory event that could be explained by the presence of a magnetic monopole.

Trower, the godfather of Cabrera's experiment, will discuss worldwide research for magnetic monopoles during his lecture. Trower, a Virginia Polytechnical Institute physics professor, and a group of researchers from VPI performed magnetic monopole experiments at the Fermi National Accelerator Laboratory (Fermilab) in the early 1970's.

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October 19, 1982

This group of researchers, formed by Trower in 1966, to study nuclear and elementary particle structure using high energy interactions has since participated in other extensive research. In addition to their research at the Fermilab, the group participated in building the first multi-particle spectrometer at Brookhaven National Laboratory and in measuring the shape of the carbon nucleus at the National Bureau of Standards. Trower's group has also participated in determining the sizes of various nuclear isotopes at the Stanford Electron Linac and in studying nuclear capture reactions at the Space Radiation Effects Laboratory. In the 1960's the group designed a meteorite detector for one of NASA's Voyager missions.

Currently, Trower's research is centered at the Fermilab where he is studying meson resonance.

A Fellow of the American Association for the Advancement of Science, the American Physical Society and the Virginia Academy of Science, Trower earned a bachelor of science degree in physics at the University of California at Berkeley. He received his master of science degree in physics and his doctorate in physics from the University of Illinois.

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RELEASE NO. 82-76

WAYNICK NAMED ASSISTANT DIVISION CHIEF AT NASA-LANGLEY

Hampton, Va.--Arthur F. Waynick Sr. has been named Assistant Chief, Business Data Systems Division at NASA's Langley Research Center in Hampton, Va.

In this position, he is responsible for the day-to-day operations of the division, and assists the chief in long range planning, including budget plans, for both equipment and software, including new or redesigned application systems development. He directs personnel involved with application systems and assists the chief in directing personnel involved with systems programing and technical software support functions.

Waynick began his career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in May 1955 as Head, Machine Tabulation Section, Fiscal Division. In July 1962 he became Head, Financial Data Processing Branch. In August 1972 he transferred to the Business Data Systems Division, where he has been Head of the Computer Systems Branch and Head of the Analysis and Programing Branch.

Before joining NACA, Waynick worked for Fieldcrest Mills from 1950 to 1955 and for Burlington Industries from 1947 to 1950. He served in the U.S. Air Force from 1945 to 1947. He is a member of the Federal Automatic Data Processing

- more -

October 25, 1982

Council of Tidewater, and has been president of the council for the last three years.

A native of Burlington, N.C., Waynick and his wife, Eleanor, live in Yorktown. They have three sons and one daughter.

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RELEASE NO. 82-77

ANDERSON LEAVES NASA, ACCEPTS UNIVERSITY APPOINTMENT

Hampton, Va.--Dr. Alvin F. Anderson, University Affairs Officer at NASA Langley Research Center, has accepted an appointment as Vice Chancellor for Institutional Development at Fayetteville State University in Fayetteville, North Carolina. Fayetteville is one of the 16 constituent institutions of the University of North Carolina. The appointment is effective November 1.

The Vice Chancellor for Institutional Development at Fayetteville State University is responsible for the management and supervision of the following functions: Institutional Research, Government Relations, Institutional Planning, Alumni Affairs, Fund Raising, Advanced Institutional Development Program (Title III), Publications and Public Relations.

Anderson joined the Langley staff in 1972 as the Center's first full-time Equal Employment Opportunity Officer. He served in this position until 1975 when he became Head of the Office of Research Grants and University Affairs. In 1976-1977 he was a recipient of a Congressional Fellowship as a result of extensive national competition. During this year he worked closely with Senator William Proxmire and Congressman Paul S. Trible of Virginia's first district.

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October 25, 1982

Anderson lists the increased proportion of Langley's research funds being awarded to historically Black colleges between 1975-1982 as a significant accomplishment during his tenure. He also is the prinicpal author of the Centers of Excellence proposal which resulted in the establishment of the Solid State Physics program at North Carolina A&T State University.

He was presented a Langley Special Achievement Award in 1978 for effective leadership of the Office of Research Grants and University Affairs which has resulted in such innovations as the Langley Summer Faculty Fellowship Program administered by the Hampton Institute. He also received the Center's Equal Employment Opportunity Award in 1981 in recognition of outstanding community outreach efforts and leadership in working with minority universities to encourage their interest and proficiency in science and engineering. Prior to coming to Langley Anderson was the Associate Director of Ethnic Studies and Assistant Professor in the Graduate School at Hampton Institute. He is Chairman of the Head Start Policy Council, a member of the Board of Trustees of Saint Paul's College, Director of the Kiwanis Club and a member of the Board of Directors of Retired Senior Volunteer Program (RSVP).

Born in Charleston, S.C., Anderson graduated from Burke High School. He received a bachelor of arts degree in sociology from Seattle University, a master of arts in counseling from John Carroll University, and the doctorate degree in counseling/psychology from the University of Virginia.

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RELEASE NO. 82-93

EXTRATERRESTRIAL INTELLIGENCE TO BE DISCUSSED AT NASA LANGLEY COLLOQUIUM

Hampton, Va.--One of the most interesting and challenging scientific problems of our age involves the question of the existence of extraterrestrial intelligence (ETI). The Earth is an average planet circling an average star, the Sun. The Sun is one of 10^{12} stars in our galaxy, the Milky Way. The Milky Way is one of some 10^{11} galaxies in the known universe. In this universe of planets, stars, and galaxies, is there no other intelligence with whom humans might share ideas? Where is everybody? Why are we unaware of extraterrestrial?

Dr. John A. Ball, Radio Astronomer, Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass., will discuss these questions at a NASA-Langley colloquium November 8. His lecture, "Extraterrestrial Intelligence: Where is Everybody?" will be held in the Activities Center at 2 p.m., preceded by a press briefing at 1:15 p.m.

Ball suggests that the possible answers to these intriguing questions can be classified into five categories: (1) There is no ETI; (2) ETI is trying to talk to us--or at least to attract our attention, but we are not yet clever enough to hear or to understand; (3) advanced civilizations don't know that

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November 1, 1982

we're here; (4) advanced civilizations know that we're here, but they don't care; they're ignoring us; and (5) advanced civilizations are discretely and inconspicuously watching us, but not dabbling. Ball will discuss these interesting possibilities during his talk.

Ball is the Director of the Radio Astronomy Facilities at Harvard College Observatory. One of Harvard's radio telescopes will shortly be used in a search for ETI. He received a bachelor of science degree in electrical engineering from the University of Nebraska and his doctorate from Harvard. He was involved in the discovery of several new interstellar molecules: Methyl and ethyl alcohol, formic acid, acetaldehyde, SO, and NS. He is also involved in radio astronomical measurements using very long baseline interferometry. Ball was a co-recipient of the 1971 Rumford Award, presented by the American Academy of Arts and Sciences, for his research in radio astronomy.

A paper with the same title as this colloquim by Ball appeared in the November-December 1980 issue of the American Scientist.

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RELEASE NO. 82-94

LANGLEY HOSTS CONFERENCE ON LARGE SPACE ANTENNA SYSTEMS TECHNOLOGY

Hampton, Va.--Recent advances in large space antenna systems will be reviewed by several hundred representatives from government, private industry and universities at NASA's Langley Research Center Nov. 30 through Dec. 3.

Large space antennas have received increased emphasis in NASA and the Department of Defense during the last several years because the antennas may greatly improve the performance of communication and observation satellites for commercial, scientific and military uses.

Antennas with diameters up to several hundred meters have been studied. These systems are a technical challenge because of their large size, and the need to minimize weight and volume for packaging in the Shuttle cargo bay.

Technology development in large space antenna systems has reached the level where plans are being developed for space flight testing in the late 1980's.

The conference program includes overviews of communications, space science, Earth observations, and military missions and systems. Over 50 technical papers will be presented in sessions on Antenna Systems, Structures and Control Technology, Electromagnetics, and Space Flight Testing.

- more -

The four-day meeting is sponsored by the NASA Office of Aeronautics and Space Technology (OAST) and Langley Research Center. Dell Williams, Director of the OAST Space Systems Division, and Paul Holloway, Langley Director for Space, are conference co-chairmen. Dr. Earle Huckins, head of Langley's Large Space Antenna Systems Technology Office is Technical Program Chairman.

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RELEASE NO. 82-95

ATMOSPHERIC RESEARCH EARNS AWARD FOR NASA SCIENTIST

Research into the atmospheres of Earth, Mars and Venus has earned a NASA scientist the 1982 Halpern Award in Photochemistry. The award is one of 12 in the physical and biological sciences given annually by the New York Academy of Sciences.

The academy's board of governors selected Dr. Joel S. Levine of NASA for the award, citing his accomplishments and leadership in studies of the photochemistry of the Earth's atmosphere and the atmospheres of Mars and Venus. Levine is a senior research scientist in the Theoretical Studies Branch, Atmospheric Sciences Division at NASA's Langley Research Center, Hampton, Va.

Presentation of all the science awards for 1982 will be made at the annual meeting of the academy Dec. 8, 1982, at the Vista International Hotel, World Trade Center, New York City. The gathering will mark the organization's 165th annual meeting.

At 40, Levine is the youngest person to receive the Halpern Award. He is also the first U.S. government employee selected in the international competition.

Photochemistry is the branch of science that deals with chemical reactions initiated by the interaction of photons with molecules. Atmospheric chemistry is

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driven by the absorption of solar photons, which leads to the production of some atmospheric components and to the destruction of others.

Over the last few years, Levine's research has included the photochemistry and composition of the Earth's early prebiological atmosphere, the chemical evolution of the atmosphere and the photochemistry of the lower atmosphere. It has also included the evolution, composition and photochemistry of the atmospheres of Mars and Venus.

While most of Levine's research involves theoretical computer modeling of atmospheric photochemical processes, additional research involves aircraft and spacecraft measurements and laboratory experiments. Samples of air exposed to atmospheric lightning have been obtained during flights of the NASA Langley Storm Hazards Project F-106B aircraft into electrically active thunderstorms. This research has led to new information on the photochemical processes initiated by atmospheric lightning.

Levine has used measurements obtained with the Copernicus Orbiting Astronomical Observatory and the International Ultraviolet Explorer satellites in theoretical computer studies of the photochemistry of the atmosphere of Mars and the photochemistry of the Earth's early atmosphere, respectively. Laboratory experiments conducted by Levine in the Langley Lightning Facility have concerned the photochemistry initiated by atmospheric lightning in the Earth's present and early atmosphere and in the atmosphere of Venus.

Other New York Academy 1982 award winners in the physcial sciences include: Dr. Frank Press, science advisor to President Carter and now president of the National Academy of Sciences; Dr. Bruce Murray, professor of planetary science at the California Institute of Technology and former director of NASA's Jet Propulsion Laboratory; Dr. Riccardo Giacconi, director of the Space Telescope

- more -

Institute at John Hopkins University; and Dr. Irwin Shapiro, newly appointed director of the Harvard-Smithsonian Center for Astrophysics. Seven other scientists will receive awards for their contributions in the biological and behavioral sciences.

Levine has been at Langley since 1970. He received a B.S. (physics) from Brooklyn College of the City University of New York, an M.S. (meteorology) from New York University and an M.S. (aeronomy and planetary atmospheres) and Ph.D (atmospheric sciences), both from the University of Michigan.

Levine is author of more than three dozen papers in refereed scientific journals. He has written chapters in five books, co-edited a volume on tropospheric chemistry, and has been the contributing editor for astronomy and space sciences for the The New York Times Encyclopedic Almanac.

He is a member of the Atmospheric Environment Technical Committee of the American Institute of Aeronautics and Astronautics; and associate editor of The Geophysical Monograph Board of the American Geophysical Union, a regional lecturer for the Society of Sigma Xi and a consultant to the Committee on Planetary Biology and Chemical Evolution of the Space Science Board of the National Academy of Sciences. Levine teaches a course entitled "Stars, Planets, and Life" for the College of William and Mary Special Programs Office, teaches the cosmology sections of a graduate course entitled "Understanding Space and Time" for the University of Virginia's Tidewater Campus, and serves as a doctoral research advisor in the School of Engineering of Old Dominion University.

Levine, his wife, Dr. Arlene Spielholz Levine, a human resource consultant and a 13-year-old daughter, Lisa live in Hampton, Va.

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MERCURY COMPANY AWARDED NASA CONTRACT

Hampton, Va. -- The SFG dba Mercury company of Tustin, Calif., has been selected for negotiation leading to the award of a contract for maintenance and operation of NASA Langley Research Center's compressed air and steam utility facilities.

Under the terms of the contract, Mercury will also operate Langley's nitrogen dispensing and chromate processing facilities. Nitrogen is used as a test medium in several of Langley's wind tunnel facilities, while the chromate processing equipment is used to remove toxic hexavalent chrome from the center's cooling tower waste water.

The basic two-year contract is valued at approximately $2.5 million. The contract also includes a one-year hard option.

The work will be performed at Langley.

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December 3, 1982

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RELEASE NO. 82- 97

ENGEN ADDRESSES AIRCRAFT ACCIDENT RESEARCH AT NASA-LANGLEY COLLOQUIUM

Hampton, Va.--Although the safety record of modern aircraft is excellent, some accidents must be expected. Major aircraft accidents, as they relate to the cooperative research between the National Transportation Safety Board and NASA to determine methods of minimizing damages, will be discussed at a NASA Langley Colloquium Monday, December 13.

Donald Engen, Vice Admiral, U.S. Navy, Retired, will speak on "Aircraft Accident Investigation Technology" in the Activities Center at 2 p.m., preceded by a press briefing at 1:15 p.m.

The NTSB and NASA work cooperatively to enhance aviation safety. Engen said the NTSB has evolved between 1926 and now to be responsible to Congress and the public as "watchdogs" of safety for land, sea and air transportation. NASA has responded to requests and provided, on its own initiative, technical data leading to increased aviation safety.

Engen, a native of Virginia, was appointed to the Safety Board by President Reagan in June 1982.

He served in the U.S. Navy and retired as deputy commander in-chief, U.S. Atlantic Command and U.S. Atlantic Fleet.

- More -

December 6, 1982

He has broad background and experience in aviation and maritime safety, including the conduct of many investigations of aircraft and ship accidents from 1944 through 1980. He is an active pilot with commercial license and instrument rating and has flown his own aircraft throughout the United States and Europe. He has been an engineering test pilot in the United States and the United Kingdom, specializing in the evaluation of flying qualities of airplanes as well as in new equipment designed to improve air traffic control in instrument conditions.

Engen has managed complex flight operations and large numbers of pilots. He has flown more than 160 models of aircraft during his 40-year career in aviation. He has commanded an ammunition ship and the aircraft carrier USS America. Many of his positions directly involved the establishment of aviation and maritime safety policy.

Among his 29 wartime decoration is the Navy Cross - the Navy's highest award for valor - which was presented to him for his actions in the sinking of a Japanese carrier in the Second Battle of the Phillippine Sea in October 1944. He also has been awarded two Distinguished Service Medals, the Defense Meritorious Service Medal and two Legions of Merit.

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RELEASE NO. 82-100

MOORE NAMED MANAGEMENT OPERATIONS SPECIAL ASSISTANT

Hampton, Va.--Frederick L. Moore has been selected as Special Assistant for Productivity Improvement of Management Systems, Office of the Director for Management Operations, at NASA's Langley Research Center. He was formerly Head, Institutional Programs Branch, Program and Resource Division.

In this recently created position, Moore serves as the center's focal point for the design and implementation of automated management systems.

Moore began his NASA career in June 1966 as an aerospace technologist in the Full-Scale Wind Tunnel. From 1970 to 1976 he was assigned to the Army and worked in the Flight Dynamics and Control Division and the Rotor Systems Research Aircraft Project Office. From 1976 to 1981 he was Head, Project Planning and Control Office in the Project Management Systems Division. He has specialized in stability and control analysis, pilot-in-the loop simulation, project planning and cost estimating of aerospace and aircraft systems.

A native of East Liverpool, Ohio, Moore attended West Liberty State College. He received bachelor and master of science degrees in aerospace engineering from West Virginia University in 1966 and from Virginia Polytechnic Institute in 1969, respectively.

- more -

December 22, 1982

The author or co-author of 16 technical publications, Moore is a member of the International Society of Parametrics.

Moore and his wife, Rosalyn, live in Newport News. They have a daughter and a son.

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RELEASE NO. 82-101

NASA FINDS NEW TECHNIQUES FOR MAPPING EARTH'S GASES

Hampton, Va.--A new technique for mapping gases in the earth's atmosphere proved accurate when compared to ground-initiated studies.

The Measurement of Pollution from Satellites (MAPS) experiment flown aboard the second Shuttle flight November 1981, charted concentrations of carbon monoxide around the world over a range from 38 south to 38 north latitudes.

The experiment was flown as part of the first scientific payloads on the Shuttle and used a gas filter radiometer to produce measurements of the carbon monoxide mixing ratio in the middle and upper troposphere and lower stratosphere.

Because of the coverage afforded by an orbiting spacecraft, a remote sensor measurement (of which the MAPS experiment is an example) will establish the global pattern of the distribution of the gas in a way that cannot be achieved using direct measurement methods (such as a gas chromatograph).

The major objectives of this experiment are to measure the mixing ratio of carbon monoxide in the middle and upper troposphere as a function of latitude, longitude, and season; to define the operational characteristics of the instrumentation system as part of an orbiting spacecraft; and to evaluate and refine the method of data inference. The results obtained to date indicate that all of

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these objectives will be achieved.

During the flight of STS-2 the MAPS experiment obtained data over about one million kilometers (620,000 miles) of the orbital track. The data taken on Orbit 15, for example, began over South America, crossed the Atlantic, continued east over the Mediterranean Sea, turned southeast over the Persian Gulf, the Arabian Sea and extended to the southern tip of India. The mixing ratio of carbon monoxide over this extended area ranged from about 70 parts per billion over the Atlantic Ocean to a high of about 120 parts per billion over the eastern Mediterranean Sea.

The analysis of experiment data so far indicate significant concentrations of middle troposphere carbon monoxide mixing with both north/south and east/west variation over the north Atlantic and the Mediterranean Sea and the Middle East. Accuracy of the measurements has been determined to be within 15 percent with a repeatability of about 5 percent from orbit to orbit.

NASA plans to refly this experiment on the 17th Shuttle, scheduled for the summer of 1984, to study seasonal variations in the total abundance and regional distribution of carbon monixide within the earth's atmosphere.

Although the STS-2 flight was abbreviated, the experiment was on for about 42 hours, and the investigators were able to corroborate the sampled areas with the instrument readings taken with under-flying aircraft.

The MAPS experiment was developed at NASA's Langley Research Center, Hampton, Va. The MAPS experiment team, which consists of personnel from Langley, Old Dominion University, Norfolk, and the Systems and Applied Sciences Corporation, Hampton, is led by Dr. Henry G. Reichle, Jr., the principal investigator.

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(NOTE: NASA-LANGLEY PHOTOGRAPHS ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY PHONING KEITH HENRY AT (804) 865-2934.)

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RELEASE NO. 83-4

NASA-LANGLEY DEPUTY DIRECTOR RECEIVES PRESIDENTIAL HONOR

Hampton, Va.—Richard H. Petersen, Deputy Director of NASA's Langley Research Center, has been honored with the Presidential Rank of Meritorious Executive. He received his award in special ceremonies at the State Department in Washington, D.C., Jan. 19.

The Ranks, authorized in the Civil Service Reform Act of 1978, are awarded by the President to career federal employees in the Senior Executive Service whose performance has been exceptional for several years.

Petersen was honored for his leadership in aeronautical research for nearly 25 years, specifically "as a leader in theoretical and experimental aerodynamics; as a contributor to the understanding of hypersonic aerodynamics and computer analysis of aircraft performance; and as Deputy Directer of the Langley Research Center, the oldest and largest research center in the Agency."

A total of 16 NASA executives received Presidential Rank, including former Langley manager, Angelo Guastaferro, Deputy Director for the Ames Research Center at Moffett Field, Calif.

The Presidential Rank of Meritorious Executive includes a cash award of $10,000.

-end-

January 25, 1983

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RELEASE NO. 83-7

NEW RESEARCH PROGRAM TO STUDY REDUCTION OF HELICOPTER NOISE

Helicopter noise will be the focus of a new NASA/industry research program that will study ways to greatly reduce noise and its causes in present and future helicopter designs.

The five-year National Rotorcraft Noise Reduction Program will be conducted by NASA's three aeronautical research centers and the industry-sponsored American Helicopter Society (AHS). The helicopter industry will supplement the $10 million NASA program with its own helicopter noise research.

Noise has always been a significant concern with helicopters, but it was formerly considered to be an unwanted "side effect" of the design considerations of these aircraft. Increased concern about the environment, however, has led the Federal Aviation Administration (FAA) to develop practical noise standards as a design requirement for all future helicopters.

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February 16, 1983

RELEASE NO. 83-7

A government and industry agreement to study and reduce helicopter noise has been reached through a Working Group on Rotorcraft Noise, composed of NASA, the AHS, the FAA and the Helicopter Association International. That agreement, signed January 21, led to establishment of the new program.

NASA's Langley, Ames and Lewis Research Centers, in Hampton, Va.; Mountain View, Ca.; and Cleveland, respectively, will study different aspects of the noise abatement program, working with industry members of the AHS-sponsored program. They are Bell Helicopter Textron, Dallas; Boeing Vertol, Philadelphia; Hughes Helicopter, Culver City, Ca.; and Sikorsky Aircraft, Stratford, Ct.

The research program will encompass the development of helicopter noise prediction and reduction technologies, noise certification, criteria for the location of heliports and low-noise operational procedures.

Government funding for the five-year project will be provided by NASA's Office of Aeronautics and Space Technology in Washington, D.C. Additional resources will be provided by the four U.S. helicopter manufacturers.

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RELEASE NO. 83-8

NASA MANAGER NAMED PENINSULA ENGINEER OF THE YEAR

Hampton, VA, Roy V. Harris, Jr., Chief of the High-Speed Aerodynamics Division at NASA's Langley Research Center, has been named Engineer of the Year by the Peninsula National Engineers Week Committee.

Harris' award will be presented at a dinner dance February 26 which will highlight the Peninsula's observance of National Engineers Week. Harris, who joined the Langley staff in 1958 as a research engineer in high-speed aerodynamics, was nominated by the local chapter of the American Institute of Aeronautics and Astronautics.

National Engineers Week, February 20-26, has, since 1951, been traditionally observed during the week of Washington's birthday to celebrate the first president's civil engineering background. This year's theme, "Engineers: Turning Ideas into

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February 15, 1983

Reality," will focus on familiarizing the public with the work of engineers. The annual celebration is sponsored by the National Society of Professional Engineers.

Among scheduled activities are an Engineers Week Seminar, sponsored by AIAA, Wednesday, February 23, at the Langley Activities Center, Building 1222, at 7 p.m. The theme of the seminar is "General Aviation," and the target audience is the general community with special emphasis for middle and high school students and college students with mathematics and physics backgrounds.

A series of lectures and film presentations will be made at Hampton, Newport News, Poquoson, York County and Peninsula Catholic High Schools. Topics to be presented by engineer role models include computer design; engineering careers; and engineering educational requirements. There will also be a Career Day for local high school students at the Langley Research Center.

Engineers Week will conclude with the dinner dance beginning at 6 p.m., February 26, at the Langley Air Force Base NCO Club. The guest speaker for the evening is former Langley manager, Dr. Walter B. Olstad, who is Associate Administrator for Management at NASA Headquarters, Washington, D.C.

- more -

Harris' award will not be his first. Past commendations have included the AIAA Lawrence Sperry Award and the NASA Special Achievement Award for Exceptional Service in 1968 for his research which led to "a significant technological foundation for the development of supersonic aircraft." In recognition of his leadership in high-speed aerodynamics research programs which have had direct application to several of the nation's current military aircraft, he was awarded a Langley Special Achievement Award in July 1982 and the NASA Medal for Outstanding Leadership in Octoer 1982.

Harris has played an active role in the AIAA for more than 20 years at the local, national and international levels and has attained the rank of Associate Fellow. In 1980 he was elected by the entire AIAA membership to serve as a Technical Director for the institute and member of its Board of Directors and Technical Activities Committee.

Harris has served as Chief of the High-Speed Aerodynamics Division since Octoer 1974. In this capacity, he plans, directs and coordinates the center's research programs in turbulent drag reduction, supersonic and hypersonic aerodynamics, hypersonic propulsion, and computational methods for high-speed flows. He is responsible for the operation of a variety of wind tunnels and

- more -

research equipment, including the Unitary Plan Wind Tunnel, Hypersonic Aerodynamics Laboratory and the Hypersonic Propulsion Laboratory.

A native of Augusta, Ga., Harris received a bachelor of science degree in aeronautical engineering from the Georgia Institute of Technology in 1958. From 1959 to 1962 he was an Air Force Officer assigned to NASA. He was appointed Head of the Advanced Configurations Branch in 1973, where he served until appointed to his present position.

Harris and his wife, Mary Sue, have two daughters. They live in Newport News.

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RELEASE NO. 83-9

CAREER DAY SCHEDULED AT NASA'S LANGLEY RESEARCH CENTER

Hampton, VA--Peninsula high school seniors will visit NASA's Langley Research Center on February 24 to take part in the ninth annual "Career Day," held in association with National Engineers Week.

The purpose of the week is to acquaint the public with the work of engineers and to honor outstanding members of the profession.

Approximately 300 seniors who are interested in engineering will take part in the 9 a.m. to 12 p.m. program, designed to expose students to different engineering fields.

The program will be opened by Steve Yaros, chairman of the Virginia Peninsula Engineers Week Committee and an engineer at Langley. Yaros will introduce the guest speaker, Gary D. Shulenburg, Director of Engineering, Newport News Shipbuilding and Dry Dock Company, who will speak on "Opportunities and Challenges of an Engineering Career."

- more -

Following Shulenburg's talk, there will be a panel discussion, "Life as a Co-op," by engineering cooperative education students from NASA and the Newport News Shipbuilding and Dry Dock Company, a Space Shuttle film, and individual meetings with representatives from 18 Peninsula engineering societies and Langley engineers.

- end -

February 15, 1983

Feb. 22, 1983

NASA News

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RELEASE NO. 83-11

Hampton, Va.--Luat T. Nguyen, an aerospace technologist in the Low-Speed Aerodynamics Division at NASA's Langley Research Center in Hampton, Va., has received the Lawrence Sperry Award for 1983.

The American Institute of Aeronautics and Astronautics annually presents the award "for a notable contribution made by a young person to the advancement of aeronautics or astronautics."

The certificate of citation presented to Nguyen read, "for the development of control system concepts that have become widely accepted and used in current generation fighter aircraft for improving maneuverability and departure/spin resistance." Given to Nguyen at the AIAA 21st Aerospace Science Meeting in Reno, Nev., Jan. 11, the award, named in memory of a pioneer aviator and inventor who died while attempting a flight across the English Channel, Dec. 13, 1923, also consists of a medal and rosette pin.

A member of the Langley staff since 1970, Nguyen leads a group of seven engineers conducting research on the high angle-of-attack flight dynamics of military and general aviation

- more -

aircraft. Primary emphasis of the work is to advance understanding of high angle-of-attack phenomena and to develop aerodynamic and control-system technologies to provide desired flight characteristics in the stall/post-stall regimes. A number of facilities and test techniques used in conducting this work include the 30-by 60-Foot Wind Tunnel, 12-Foot Low-Speed Wind Tunnel, Differential Maneuvering Simulator, General Aviation Simulator and the Radio-Control Helicopter Drop-Model Facility.

Born in Viet Nam, Nguyen came to the U.S. at the age of 9. He attended primary and secondary schools in Washington, D.C. He received a bachelor of science degree in 1968, and master of science and professional engineer degrees in 1970, all in aeronautics and astronautics, from the Massachusetts Institute of Technology. While in college, he was a research assistant for the Center of Space Research at MIT. There he was responsible for the design and analysis of an automatic attitude orientation and stabilization system for a small space probe.

The author or co-author of 29 technical publications, Nguyen has received a Langley Special Achievement Award, two Langley Group Achievement Awards, and three NASA Group Achievement Awards. He was the co-recipient in 1979 of the H. J. E. Reid Award, given for the best Langley paper written that year.

Nguyen and his wife, Mimi, live in Williamsburg, Va. They have one daughter.

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RELEASE NO. 83-12

NASA-LANGLEY TO HOST CONFERENCE ON SHUTTLE LESSONS LEARNED

Hampton, Va.--The initial Shuttle flights have generated a rather widespread activity to examine and analyze the data obtained. General objectives of this effort have been to certify the vehicle for operational use and to examine NASA's ability to predict the performance of a complex entry configuration.

A number of papers given at recent conferences have reported on some aspect of the Shuttle's flight performance and compared it to prediction or the pre-flight data base. As yet, however, a forum has not been specifically designated for a comprehensive review of this work.

To fulfill this need, NASA's Langley Research Center is sponsoring a conference, titled "Shuttle Performance: Lessons Learned," March 8-10, in the Activities Center, Building 1222.

The program includes two sessions each on launch and ascent performance, entry aerodynamics and aerothermal environment; and single sessions on thermal protection system, guidance, navigation and control, and measurements and analysis techniques.

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February 25, 1983

The conference is an opportunity for researchers from universities, private industry, NASA and other government agencies, to exchange information and ideas on the interpretation of data provided by the Orbiter Flight Test Program and to make a critical examination of the methods used to predict performance from wind-tunnel data and analytical techniques. Over 50 papers, covering a variety of disciplines and aspects of the vehicle's performance, will be presented by attendees from NASA's Johnson Space Center, Marshall Space Flight Center, Ames Research Center and Langley; the Air Force; Rockwell International; McDonnell Douglas; Lockheed Missiles and Space Company; and others.

Co-chairmen of the conference are James P. Arrington and Jim J. Jones of Langley. Session chairpersons include Bernard Spencer, Jr.; David A. Throckmorton, Howard W. Stone, Jr., George M. Ware, Dr. Richard E. Snyder, E. Vincent Zoby, William I. Scallion, Harold R. Compton and C. L. W. Edwards of Langley; James C. Young, Dorothy B. Lee, Dr. Kenneth J. Cox, Ernest R. Hillje and Barney B. Roberts, from the Johnson Space Center; Donald C. Schlosser and Tru E. Surber, Rockwell International; Howard E. Goldstein, Ames Research Center; and Dr. John J. Bertin, University of Texas at Austin.

Additional information concerning the conference may be obtained by calling Bettie Messier at (804) 865-3031 or 928-3031.

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RELEASE NO. 83-13

DAVENPORT NAMED ASSISTANT CHIEF OF NASA-LANGLEY DIVISION

Hampton, Va.--Joseph B. Davenport, Jr., has been named Assistant Chief of the Fabrication Division at NASA's Langley Research Center in Hampton, Va.

In this position, Davenport assists the division chief in planning, developing, directing, programming and evaluating technical services to build research test models and associated systems and equipment in support of Langley projects and programs requirements; develops and manages the division's Institutional Management System; and participates in the overall administration of contracted services, including metal, wood, composite, electronics and fabrication support contracts. He is responsible for the continuing development of processes, procedures and programs for improving fabrication methods and practices, including effective and efficient use of numerical-controlled machining systems and computer-aided fabrication equipment.

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March 1, 1983

Davenport began his NASA career in November 1961 as an apprentice machinist. Since graduating from the Langley Apprentice School in 1965, he has been an experimental machinist, engineering technician, a supervisory engineering technician and a supervisory production controller. He has specialized in aeronautical research model fabrication, cryogenic model fabrication techniques and fabrication contract management.

Before joining Langley, Davenport designed interior displays for a private museum in Lenox, Mass.

Davenport has received five Langley Suggestion Awards and numerous Group Achievement Awards. He was the fabrication session chairman for the Industry-wide Cryogenic Models Workshop held at Langley in 1982.

Davenport and his wife, Ann, live in Hampton. They have two sons.

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RELEASE NO. 83-15

NOTICE TO NEWS PEOPLE - CONGRESSMAN VOLKMER TO SPEAK AT WORKSHOP

Hampton, Va.--U.S. Rep. Harold L. Volkmer and NASA Administrator James M. Beggs will be keynote speakers at two evening banquets during NASA's Space Station Technology Workshop, March 28-31, in Williamsburg, Va.

Over 600 aerospace experts from government agencies, industry and universities will attend the workshop to help define a technology development program to support the establishment of a permanent human presence in space.

Volkmer, Chairman of the House Sub-Committee on Space Science and Applications, will speak after the workshop's March 28 banquet. Beggs' speech, "Space Station Planning: A Partnership for the New Technology," will be delivered after the workshop's closing banquet on March 31.

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March 21, 1983

Both speeches are open to the news media and will begin at 8 p.m. in the Presidents' Hall at the National Conference Center adjacent to the Williamsburg Hilton Hotel.

Media representatives who plan to attend any portion of the four-day workshop from 9 a.m. to 5 p.m., can contact Maurice Parker, NASA Langley Public Affairs Officer (865-2935), or at the National Conference Center (220-3500).

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RELEASE NO. 83-16

THE IMPACT OF SCIENCE ON SOCIETY IS TOPIC FOR PUBLIC LECTURE SERIES

Hampton, Va.--In recognition of NASA's 25th anniversary, the 1983 NASA Langley Research Center and the College of William and Mary Public Lecture Series will emphasize science and its impact on mankind, society and the universe. Leading off the series will be internationally known TV host, writer and producer, James Burke, from London, England. Burke will speak on "The Impact of Science on Society," Monday, April 4, at 8 p.m. at the Hampton Coliseum.

For more than a decade, Oxford-educated Burke has been one of the British Broadcasting Company's outstanding writers, hosts and producers. Among his science features are the 1972 Royal Television Society gold-medal winner "The Burke Special," coverage of the U.S. Space Program, and "The Invention of America" for the U.S. Bicentennial. His 10-part series "Connections," surveying the history of technology and social change, attracted one of the largest followings ever for the Public Broadcasting Station documentary series and the related

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March 23, 1983

book was a best seller in both the U.S. and England. The show traced the evolution of eight major modern inventions - the atom bomb, telecommuications, computer, production line, jet aircraft, plastics, rocketry and television. Burke's most recent TV show "Burke - The Real Thing" is a six-part series on the brain and human perception.

Burke believes that technological change can be triggered by a variety of unrelated factors. In turn, these technological innovations have their own triggering effects, sometimes in totally unrelated fields. In his lecture, Burke will review some of these changes and examine how society lives with perpetual innovation that transforms its attitudes, morals and values.

Free tickets for family attendance at the 8 p.m. lecture at the Hampton Coliseum are available by mail by phoning 877-9231, ext. 60, 63, or 64, prior to March 30, and in person from the Coliseum Box Office or door after March 30.

Prior to these lectures, Burke will guest on the WTAR AM-790 Radio Talk Show from 8 to 9 p.m., Sunday, April 3.

NOTE TO EDITORS: Burke will give the same lecture at a NASA Langley Colloquium that afternoon. The lecture will be held in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15 p.m.

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RELEASE NO. 83-17

NASA SELECTS TEST CARRIAGE CONTRACTOR

Hampton, Va.--Chicago Bridge & Iron Co., of Philadelphia, has been selected for negotiation of a contract to build a main test carriage for the Aircraft Landing Dynamics Facility at NASA's Langley Research Center.

The facility is used to conduct aeronautical experiments with various landing devices under simulated airport runway conditions. Different test vehicles and experiments are mounted aboard the test carriage and sped along a track.

Construction, testing and delivery of the main carriage is part of an overall modification of the facility. The track will be extended 600 feet, to a total length of 2,800 feet, to accommodate present and future test requirements for aircraft and spacecraft landing gear research.

- more -

March 23, 1983

The main carriage will weigh approximately 100,000 pounds, depending on the weight of a test vehicle, and can accelerate to about 253 miles an hour during a test run.

The firm-fixed-price contract is valued at approximately $1.27 million. Work is scheduled to be completed within 495 days from the time the contract begins.

Chicago Bridge & Iron will build and test the carriage in Memphis, Tenn., and at NASA-Langley.

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RELEASE NO. 83-18

DOVE, GARREN NAMED ASSISTANT CHIEFS OF NASA-LANGLEY DIVISION

HAMPTON, Va.--Billy L. Dove and John F. Garren, Jr., have been designated Assistant Chiefs of the Flight Control Systems Division at NASA's Langley Research Center in Hampton, Va. Dove is former Technical Program Manager and Garren is former Head of the Flight Management Branch in the same organization.

In his new position, Dove will have technical responsibility for programs relating to flight crucial systems for future aircraft and spacecraft. Garren will assist the division chief in flight management research programs, such as avionic and other technology advances for improved efficiency and safety of aircraft operations.

Dove began his career in June 1956 as an aeronautical research intern. He served in the U.S. Army from August 1956 to September 1958. Upon his return to Langley, he was a research engineer assigned to the Flight Research Division. He became

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Head, Spacecraft Instrumentation Development Section, Instrument Research Division, in 1963; Head, Aircraft Instrumentation Branch, Flight Instrumentation Division, in 1969; and Technical Program Manager in 1981.

He has specialized in fault tolerant computing, and aircraft and spacecraft electronic instrumentation systems. He is a U.S. member of the Avionics Panel, AGARD-NATO.

Dove received a bachelor of science degree in physics from North Georgia College in Dahlonega, Ga., in 1956.

He and his wife, Nell, live in Wake, Va. They have three boys.

Garren joined the Langley staff in 1959 as an aeronautical research engineer in the Flight Research Division. He was Head, Control and Guidance Section, Low-Speed Aircraft Division, from March 1971 to May 1981; Head, Flight Management Branch, Flight Mechanics Division, now the Flight Control Systems Division, from May 1981 until he was appointed to his new position.

He has specialized in in-flight simulation techniques, aircraft stability and control, aircraft handling qualities, flight operating procedures and techniques, and pilot information requirements.

- more -

Garren received a bachelor of science degree in physics from the University of Richmond in 1959.

The author or co-author of 28 technical publications, he has received a Special Achievement Award, a NASA Group Achievement Award and a Tech Brief Award. He co-authored the paper which was selected as the Outstanding Publication of the Aeronautics Directorate for 1975. He holds patents for a mechanical stability augmentation system and for a filtering technique based on high frequency plant modeling for high-gain control.

Garren and his wife, Mary, live in Newport News, Va. They have two daughters.

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RELEASE NO. 83-21

CONWAY APPOINTED ASSISTANT CHIEF OF NASA LANGLEY DIVISION

HAMPTON, VA.--Bruce A. Conway, a native of Hampton, has been appointed Assistant Chief, Flight Electronics Division, at NASA's Langley Research Center. He is former Technical Assistant to the Director for Electronics.

In this position, Conway will be responsible for assisting the chief in directing a broad program of spacecraft and aircraft instrumentation engineering research and applications. He will take part in the overall management and technical direction of electronics sensor, communications and information systems technology activities in support of Langley's spacecraft flight projects and research programs.

Conway began his NASA career in 1961 as a student trainee in the cooperative engineering program between Langley and Virginia Polytechnic Institute and State University. From 1965 to 1972 Conway was an aerospace technologist. He served as the Technical Assistant, Flight Dynamics and Control Division, from 1972 until July 1975. From August 1975 to July 1976 Conway served a one-year tour as Chief of Avionics at NASA Headquarters in

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Washington, D..C., as part of the NASA Career Development Program.

Upon his return to Langley in August 1976, he became Staff Assistant to the Director for Electronics. In March 1981 he was appointed Technical Assistant, where he assisted the Director for Electronics in the conception, monitoring and implementation of research programs in electronics for aerospace applications. He also participated in the management of Directorate activities, such as computation and instrumentation which support virtually all of Langley's in-house research programs.

Conway graduated from Hampton High School in 1960 and received a bachelor of science degree in aerospace engineering from Virginia Polytechnic Institute and State University in 1965. He earned a master of science degree in aerospace engineering from George Washington University in 1974.

The author of five technical papers, Conway has received two Langley Group Achievement Awards, a NASA Group Achievement Award and a Skylab Achievement Award.

Conway and his wife, Carol, live in Seaford, Va. They have two children: Robert, a junior at Georgetown University, and Cathy, a senior at York High School.

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Release No. 83-22

NASA STUDIES FIRST GLOBAL 'SNAPSHOTS' OF OZONE

A high-flying satellite experiment is providing NASA researchers with their first instantaneous views of ozone on a global scale.

These large-scale "snapshots" are made possible by modifications to a University of Iowa instrument orbiting the Earth at 20 times the altitude of previous ozone-measuring systems. From this lofty height, scientists can remotely monitor the movement of this environmentally important gas for hours at a time and have, already, detected significant short-term variations in ozone features.

These results were reported recently by Gerald Keating, a senior scientist at NASA's Langley Research Center in Hampton, Va., at international scientific meetings in Canada and England. Keating says that "scientists are generally excited when they see these informative, yet beautiful, images of ozone from space."

Most atmospheric ozone (which shields the Earth's surface from harmful solar ultraviolet radiation) resides above the cloud tops in the lower stratosphere. Meteorologists suspect that, in areas of low pressure at these altitudes, the base of the stratosphere drops and ozone-rich stratospheric air fills in the region, causing an increase in the total column of ozone; thus the dynamics of the lower stratosphere will be

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mirrored by the variations of ozone concentrations.

For example, by viewing the short-term variations of ozone, scientists can detect changes in the location of the jet stream — a high-altitude core of strong winds. Knowledge of these variations in the jet stream, which is often a trigger for severe storms, may improve predictions of tornadoes and other weather phenomena.

Since jetliners use the jet stream to give them a tailwind boost, knowing the short-term changes in the jet stream could improve aircraft fuel economy. Studies performed by Northwest Airlines, using data from a NASA satellite (the Total Ozone Mapping Spectrometer aboard Nimbus 7), demonstrated the value of knowing the ozone distribution to improve airline routing. Detailed information on regions of high ozone could also reduce the hazard of high ozone cabin levels in commercial aircraft.

Images of the instantaneous distribution of ozone over the Pacific Ocean, like those being analyzed at Langley, could also improve estimates of the altitude variations of the base of the stratosphere. This, in turn, has potential for improving weather predictions for North America.

Data for the ozone images are collected for beaming to Earth by an instrument known as the Spin-Scan Ozone Imager. It is part of a larger optical system, built by the University of Iowa, aboard NASA Goddard Spaceflight Center's Dynamics Explorer I spacecraft. The optics were designed principally to view the aurora and airglow in the Earth's extreme upper atmosphere.

In December 1980, the principal investigator of the University of Iowa optical system, Lou Frank, and colleague John Craven, contacted Keating concerning the possible addition of filters to their instrument to study atmospheric ozone. Keating proposed a set of filters to view the ozone distribution using solar radiation scattered by the atmosphere. Within months, these filters were built and launched into orbit in August 1981 aboard Dynamics Explorer I.

Data for an image of the Earth's ozone distribution can be collected in 12 minutes, with resolution ranging from 120 km (75 mi.) to 3 km (1.9 mi.), depending on the altitude of the spacecraft. Its highly elliptical (oval) orbit is as high as 23,296 km (about 14,450 mi.) to as low as 560 km (about 350 mi.).

Keating says that major savings in costs and development time have been made by modifying computer software developed for NASA by Systems and Applied Sciences Corp. of Riverdale, Md.

Working with Keating is SASC's David Young, who explains that each ozone image consists of tens of thousands of individual measurements. "In order to generate an ozone image, complex calculations concerning the absorption of sunlight by ozone must be made for each measurement. The resulting image is then displayed on a computer screen from which it is photographed," Young says.

The images bear a striking resemblence to upper atmospheric weather maps. Regions of high and low ozone, similar to high and low pressures on a weather map, are clearly seen moving to the east at mid latitudes. Generally, high ozone concentrations occur in regions of low pressure, near the base of the stratosphere, and low ozone concentrations occur in regions of high pressure. Near the equator the variations in ozone appear to be much smaller and the average concentrations are lower. A sharp change in ozone concentrations is generally evident near the location of jet streams and, from this signature, the jet stream can be clearly observed meandering snakelike across the globe.

Keating, who heads Langley's science team for the experiment, is also studying images for possible ozone signatures of "folding events." These localized events occur at the boundary between the stratosphere and the lower atmosphere near the location of strong jet streams. During folding events, this boundary lowers in altitude and folds back on itself, creating an area where mixing between these two atmospheric regions is greatly enhanced. Through these folds, ozone may be lost from the stratosphere by escaping into the lower atmosphere, where it is subsequently destroyed. By understanding the formation, evolution, and extent of these folds, researchers are hoping to better understand the natural loss mechanisms of the Earth's ozone.

The satellite ozone measurements are being compared with measurements obtained by approximately 100 ground-based ozone stations around the world. Although coverage from these stations is sparse, the two data sets agree remarkably well. There are plans to compare these data with measurements made by lower orbiting satellites, such as the Total Ozone Mapping Spectrometer, and with measurements made during the November 1981 flight of the Space Shuttle Columbia.

"Perhaps one day," Keating says, "an operational instrument similar to our experimental model could fly on a geosynchronous weather satellite and be used routinely for a number of applications, ranging from improved weather predictions to greater fuel economy for airlines."

Others working in the ozone investigations include Walter Bressette and Alton Mayo of Langley, Kent Ackerson of the University of Iowa, John Nicholson III, P.K. Bhartia and Ken Klenk of Systems and Applied Sciences Corp., Carl Mateer of Atmospheric Environmental Service (Canada), Mel Shapiro of the National Center for Atmospheric Research and Ted Pepin of the University of Wyoming.

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(NOTE: NASA-LANGLEY PHOTOS L-82-10,928 (COLOR) AND L-82-10,929 (B/W) ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY PHONING KEITH HENRY AT 804-865-2934/2932. (VIDEO TAPE ALSO AVAILABLE, CONSISTING OF TIME-LAPSE COLOR IMAGES SHOWING MOVEMENT OF THE OZONE DISTRIBUTION.)

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RELEASE NO. 83-23

NASA-LANGLEY RESEARCHER COMPETES FOR SPACELAB PAYLOAD SPECIALIST POSITION

HAMPTON, VA.--A NASA-Langley Research Center researcher who has always dreamed of flying may have that dream fulfilled in 1984, despite a handicap he has had since birth.

Dr. Roger K. Crouch, who is color blind, is a candidate for a payload specialist position to fly aboard Spacelab 3, scheduled for launch in November 1984.

Crouch explained that he always wanted to be an astronaut and a pilot, but he could not get a pilot's license because the Federal Aviation Administration requires full color vision in order to fly. He put the flying idea aside and came to work for NASA in June 1962.

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Four years ago, Crouch became involved in a program for materials processing in space and was a member of a working group on experiments for Spacelab 3. About that same time, he found out about the payload specialist program. NASA had already selected specialists for Spacelabs 1 and 2, but not for the Spacelab 3 mission. The Materials Processing in Space Office at NASA Headquarters was funding the experiments. "I told them that I wanted to be a specialist and I applied. I felt that getting involved in the program would be my best opportunity and probably my only chance to qualify for flight," Crouch said.

Not long after he applied, NASA cancelled the program. When it started again in January 1983, the previous applications were reviewed and applicants were called to see if they were still interested in becoming payload specialists. "'You betcha,' was my answer. I was so excited. I told them they had made my day," Crouch said.

The applicants were screened and tested. The list was narrowed from approximately 15 to seven, to four, and now two will be selected. "I recently passed my physical in Houston," Crouch said. "That was half of the battle. I think I have convinced NASA that I don't need to see every color accurately to conduct the planned experiments on Spacelab 3. My color deficiency really won't affect managing the experiments. I can

- more -

detect color contrasts enough to know how an experiment is doing." He explained that it depends on the type of experiment being managed in space as to how much color vision a specialist needs to conduct the experiments.

Crouch went to the Jet Propulsion Laboratory in California April 6 for the final selection interview. The announcement is expected to be made by NASA Headquarters within the next few months. "All I can do now is wait. I'm optimistic. I'll fly; I know I will."

The selected specialists will go to the Johnson Space Center for three months of astronaut training, becoming familiar with the Space Shuttle and flying in a KC-130 training plane. The specialists will spend some time with the principal investigators of the experiments that will fly on Spacelab 3, learning about the experiments and what results are expected from each.

An aerospace technologist in the Physical and Optical Electronics Branch, Instrument Research Division, Crouch's expertise is in growing crystals. If he is selected to fly, he will attempt to grow crystals with higher purities, to make detectors out of them and to compare growing them in space with growing them on Earth.

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Crouch has conducted research in growing crystals since 1975. "I was the 1979 recipient of the Floyd Thompson Fellowship and was privileged to study under Dr. August Witt and Harry Gatos at the Massachusetts Institute of Technology. They had experiments on Skylab and Apollo missions. My research involved studying the effects of gravity on semi-conductor crystal growth and materials processing in space. The fellowship gave me the credibility I needed and I believe my work at MIT was impressive to the selection committee.

"That year at MIT also gave me more confidence in myself and my work. I started feeling better about myself and about Langley. In fact, Langley has been very supportive in my endeavor," Crouch said. Langley has already had a test pilot selected as an astronaut. Fred Gregory has been named as the pilot for STS-18. Gregory worked at Langley from 1974 to 1978.

Langley is also involved in other experiments that will fly on future missions. Three researchers, Dr. Archibald L. Fripp Jr., William J. Debnam Jr. and Ivan Clark, are doing work in materials processing in space. They will have a crystal growth experiment, Materials Experiment Apparatus (MEA-A2), on STS-12. "It's a small effort, but we are getting recognized in the outside community of crystal growers, and that's good," Crouch said.

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Crouch, Clark and Dr. James B. Robertson have contributed pyroelectric infrared detectors and Gale Harvey has contributed ultraviolet optical materials and detectors to the Active Optical System Components (AOSC) experiment that will fly on the Long-Duration Exposure Facility (LDEF), designed and built at Langley, on STS-13.

Excited and optimistic about the prospects of flying on the Space Shuttle, Crouch said that if he does not make the rank of payload specialist--prime or backup-- this time, he will try again. "I love my life and I love my work," he said. "I like to know where I'm going, but I like to enjoy what I'm doing on the way there. I may not fly on Spacelab 3, but I will fly someday."

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RELEASE NO. 83-24

REMSBERG, MAESTRELLO RECEIVE FLOYD THOMPSON FELLOWSHIPS AT NASA-LANGLEY

HAMPTON, VA.--Two NASA-Langley Research Center researchers have been awarded Floyd L. Thompson fellowships for 1983-84.

Dr. Lucio Maestrello, Transonic Aerodynamics Division, will spend one academic year at the California Institute of Technology. Dr. Ellis E. Remsberg, Atmospheric Sciences Division, will study at the University of Washington.

The Thompson Fellowship Program was established in 1977 to encourage the development of research potential among the Langley staff. The Fellowship allows researchers who have demonstrated continued growth in research to spend up to 12 months at an educational or research institution. It is named in memory of Dr. Floyd L. Thompson, Langley Director from 1960 to 1968.

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While at the California Institute of Technology, Maestrello will study and quantify experimentally active control of laminar-turbulent transition and develop a theory. "This research work is designed to extend the Liepmann-Nosenchuck experimental work, which was done in water, to air where the boundary layer excitation is produced by incoming sound waves," Maestrello explained. "Liepmann and Nosenchuck succeeded in controlling the boundary layer in water in a time dependent frame, thus delaying the rapid evolving transitional stages."

Maestrello said active control is a new, powerful method used in flow control and is made possible by the developments and improvements of computer controlled experiments. This new concept is of great scientific interest and has tremendous potential for reducing drag. The energy required to stabilize flow using active control can be very small compared with passive methods. "The eventual goal of this research effort is to control the forced instabilities, using the active control method pioneered by Liepmann and Nosenchuck," Maestrello said.

"The opportunity to be associated and work with internationally recognized leaders in fluid mechanics, along with a relatively undisturbed and intensive period of research, will enhance and improve the center's position in planning and

- more -

conducting analytical and experimental efforts toward aerospace vehicle drag reduction," Maestrello said.

Remsberg has produced several high accuracy data sets about the properties of the upper atmosphere based on the results of the Limb Infrared Monitor of the Stratosphere (LIMS) experiment.

He said he will be working with people who have extensive experience in combining such large satellite data sets with complementary conventional meteorological data sets in order to draw specific scientific conclusions about the upper atmosphere.

"I want to learn essential details of these procedures, work with counterparts there on refining the theory of ozone distribution in the mesosphere, based on data recently acquired at Langley, and to discuss a recently approved research proposal dealing with the photochemistry and dynamics of the upper atmosphere," Remsberg explained.

"The proposed research at the University of Washington is highly relevant to the Langley charter to maintain excellence in remote sensing technology and atmospheric sciences," Remsberg said.

Maestrello began his Langley career in July 1970 as an aerospace engineer. He has worked as an acoustician and

- more -

aerodynamacist conducting experimental, analytical and numerical studies in aeroacoustics and flow stability. He was Head of the Aeroacoustics Section from May 1975 to February 1977. His present work in the Airfoil Branch includes theoretical, experimental and numerical research in aero-fluid mechanics, specifically drag reduction through active control. He is also involved in the design of a unique test apparatus, the Laminar Flow High Reynolds Number Transition Research Apparatus.

Before coming to NASA, he was a research specialist at the Boeing Company, the University of Toronto and Imperical College, University of London.

A native of Legnago Verona, Italy, Maestrello received a bachelor of science degree in mechanics from Istituto Galileo Ferraris, Verona, in 1950. He earned his doctorate in acoustics from the University of Southampton, England, in 1976.

The holder of one patent, Maestrello is the author or co-author of about 70 technical papers. He is a Fellow of the Acoustical Society of America, Associate Fellow of the American Institute of Aeronautics and Astronautics and a member of the American Physical Society.

He has received NASA's Exceptional Scientific Achievement Medal and several Group Achievement and Special Achievement awards.

Maestrello and his wife, Caterina, live in Newport News. They have two daughters and two sons.

Remsberg joined the Langley staff in 1973 as an aerospace technologist in the Lidar Applications Branch. In 1977 he was assigned to the Atmospheric Sciences Branch, now known as the Theoretical Studies Branch. His present research involves remote sensing of the atmosphere and analysis of data from the Nimbus 7 LIMS experiment. He is particularly interested in the distribution of stratospheric ozone and water vapor, and has specialized in atmospheric physics and chemistry and passive and active remote sensing.

He has been a junior research assistant with the National Radio Astronomy Observatory, a geophysicist with the Department of Commerce, a research assistant with the University of Minnesota, and has taught at the University of Wisconsin, College of William and Mary and Old Dominion University.

Remsberg received a bachelor of science degree in physics from Virginia Polytechnic Institute in 1966 and a master of science degree and a doctorate in meteorology from the University of Wisconsin in 1968 and 1971, respectively.

The author or co-author of 66 technical publications, Remsberg has received two Group Achievement awards, two Special

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Achievement awards and an award for writing the outstanding publication within the Space Directorate for 1980.

He is a member of the American Meteorological Society and the American Geophysical Union.

Remsberg and his wife, Judy, live in Grafton. They have a daughter and a son.

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RELEASE NO. 83-25

NASA-LANGLEY HONORS INVENTORS AT LUNCHEON

HAMPTON, VA.--Thirty-three Langley inventors who received United States patents in 1982, the NASA Inventor of the Year, plus recipients of Langley's Technology Transfer awards, were honored at the annual Inventors' Luncheon Wednesday, April 27.

Dr. Donald P. Hearth, Langley Director, presented the awards. Guest speaker for the luncheon was Louis Mogavero, former Director of NASA's Technology Utilization Program. Mogavero is now President of Trantek Inc., a company specializing in transferring technology between companies, both domestically and overseas, and between government and industry.

Dr. Joseph S. Heyman, who now holds 13 patents, was named NASA Inventor of the Year for his invention of a pulsed phase locked loop strain monitor. (See Langley Release No. 83-26 on Heyman.)

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May 2, 1983

In addition to the NASA inventor award, Heyman received a patent award for his 1982 invention, along with patent awards for an acoustic tooth cleaner and a liquid-immersible electro-static ultrasonic transducer. He shared the latter award with Dr. John H. Cantrell, Jr.

Other inventors receiving awards were Stephen C. Irick, for a continuous self-locking spiral wound seal; E. Thomas Freeman and Francis W. Dreisbach, both retired, and Charles W. Stump, for a film advance indicator; Anne K. St. Clair, for an electrically conductive palladium containing polyimide films;

Thomas A. Shull, for a digital demodulator; Dr. John D. Buckley, Robert J. Swaim and Robert J. Fox, for a one-step dual purpose joining technique; Thomas Vranas, retired, for a hot foil transducer skin friction sensor; Ronald N. Jensen, for a solar engine; Charlie M. Jackson, Jr., Samuel M. Dollyhigh and David S. Shaw, for a metric half-span model support system; Dr. Wolf Elber, for a means for controlling aerodynamically induced twist;

William E. Miller, for a photocapacitive image converter; Dr. Judd R. Wilkins and David C. Grana, both retired, for an apparatus and process for microbial detection and enumeration; Harold G. Bush, for a mechanical end joint system for structural

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column elements; Dr. Archibald L. Fripp, Jr., Dr. James B. Robertson and Dr. Roger A. Breckenridge, for pyroelectric detector arrays;

Wilmer H. Reed, III, retired, for a decoupler pylon: wing/store flutter suppression; L. Robert Jackson for a multiwall thermal protection system; Leland A. Imig, retired, and Mickey R. Gardner, for a heating and cooling system; David B. Rhodes, for scanning a focal laser velocimeter projection lens system; Theodore R. Creel, Jr., and Ivan E. Beckwith, for a sound shield; and Robert K. Robertson and Harry M. Tomlinson, for a fuselage structure using advanced technology fiber reinforced composites.

Technology Transfer awards were presented to Dr. Jag J. Singh and to the Instrument Research Division. The citation accompanying Singh's award read, "Outstanding leadership in the transfer of NASA technology, through the management of applications projects, responding with solutions to problem statements, and providing technical assistance to industry and other government agencies, resulting in substantial benefits to the public and industrial sectors of the nation."

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The division's award, accepted by Marvin F. Burgess and David R. Johnson, was given for "Outstanding achievements in the transfer of technology to industry, other government agencies, and the public, resulting in substantial benefits to the recipients and reflecting great credit to NASA."

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RELEASE NO. 83-26

LANGLEY RESEARCHER NAMED NASA INVENTOR OF THE YEAR

HAMPTON, VA.--A researcher at the Langley Research Center has been named NASA Inventor of the Year for 1982.

Dr. Joseph S. Heyman, a section head in the Instrument Research Division, was presented the award by Langley Director Dr. Donald P. Hearth during a special ceremony honoring Langley inventors April 27.

Heyman received the award for inventing an ultrasonic (very high acoustic frequency) instrument, called a pulsed-phase, locked loop strain monitor. The instrument can precisely measure changes in acoustic propagation time with application to residual stress in materials; material curing, such as composites; and measuring thickness variations in materials.

"We are primarily interested in materials characterization for non-destructive examination," Heyman said. "The instrument allows a material to vibrate at its own natural frequency. By

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measuring this natural frequency, we can determine properties of the material, such as the elastic constants, the thickness or the composite's curing state, so that it can be examined. From that, we can tell if the material is properly made or in a proper state--the amount of stress placed on the material--with the ultimate goal of extending the 'safe life' of the material. Such a science base could prove invaluable in operational monitoring of space platforms, for instance."

Heyman said that the instrument is about one thousand times more sensitive than any other ultrasonic measurement. He considers it a major breakthrough and is now building a multiple pulsed-phase locked loop for imaging. "We will be able to take a material and get a picture, painted in the light of those same properties, for further examination," he explained.

Heyman has received numerous awards for his research, including the IR-100 award, presented by Industrial Research Development Magazine for each of the 100 most significant technical developments of the year. He is the first person in the history of the award to receive four IR-100s, for the years 1974, 1976, 1978 and 1981. He was presented the Arthur S. Flemming Award by the Downtown Jaycees of Washington, D.C., as one of 10 outstanding young federal government employees of 1981. He was presented a NASA Exceptional Service Medal and a Langley Technology Transfer Award in 1979.

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A native of New Bedford, Mass., Heyman graduated from Tabor Academy in 1961. He attended Cornell University and Northeastern University, Boston, where he received a bachelor of arts degree with honors in physics in 1968. He earned master of arts and doctorate degrees from Washington University, St. Louis, in 1971 and 1975, respectively. In 1979 he was appointed adjunct professor of physics at the College of William and Mary.

Heyman began his NASA career as a cooperative education student in 1964. He is a research physicist and head of the Materials Characterization Instrumentation Section, where he coordinates a basic research program in ultrasonic interactions in materials and a program of applications of ultrasonic techniques to materials physics, solid state physics and electronic materials.

The author or co-author of more than 100 technical publications and presentations, Heyman holds 13 patents. He is a member of Sigmi Xi, the American Physical Society, the American Association for the Advancement of Science, the Society for Experimental Stress Analysis and the Institute of Electrical and Electronics Engineers, Sonic and Ultrasonics. He serves on a number of government committees for non-destructive examination.

Heyman is married to the former Berna Judith Levine, and has one daughter, Laura Dawn. They live in Williamsburg.

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RELEASE NO. 83-27

THERE'S NO BUSINESS LIKE SMALL BUSINESS AT NASA-LANGLEY

HAMPTON, Va.--President Reagan has proclaimed the week of May 8 as Small Business Week to honor the nation's 13 million small businesses and NASA's Langley Research Center is helping celebrate. For FY 1963, Langley's goals for contract awards to small businesses, minority firms and women-owned firms are $58.5 million, $9.5 million and $3.3 million, respectively.

Small business firms are doing many jobs at Langley, including building and ground maintenance, warehousing, transportation, security, custodial service, data management, and research and development. Last year, Langley was number one in NASA for the highest percentage of business dollar awards made to small businesses (34 percent) and women-owned businesses (two percent).

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It is NASA policy to place a fair proportion of its total purchases and contracts for supplies, research and development, and services with small business concerns. Each year, NASA Headquarters sets socioeconomic program goals for contract awards at each center.

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RELEASE NO. 83-28

BERGMAN TO ADDRESS 'ACCOMPLISHMENTS OF SCIENCE TO THE YEAR 2000' AT PUBLIC LECTURE

HAMPTON, Va.--In his long career as an ABC-TV science editor, writer and reporter, Jules Bergman has had a unique view of our nation's space program. Not only has he covered all U.S. manned space flights, including the Apollo-Soyuz Test Program, the fall of Skylab, and Space Shuttle pilot training, but he has frequently participated in the astronauts rigorous training programs and flight simulations.

As a prolific writer and colorful commentator, Bergman has chronicled our nation's space program from its infancy to its present state.

As part of the "Our Future in the Cosmos" Public Lecture Series and in honor of NASA's 25th anniversary, Bergman will analyze some of the major events he has covered in the past 30 years during his presentation, "Accomplishments of Science to the Year 2000," Monday, May 16, at 8.p.m. at the Hampton Coliseum.

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May 4, 1983

During his presentation, Bergman will discuss the perils and promises of the scientific developments expected by the year 2000 in space flight, aviation, medicine and computers, as well as their effects on the future and our quality of life.

In addition to his coverage of the U.S. space program, Bergman, a pilot himself, has covered the first flights of almost every new military and commercial aircraft in the United States. He has also covererd the tragedies of major airline disasters around the world.

Among other events, Bergman covered the recall of Ford's Pinto automobile, Three Mile Island and the nuclear power controversy, the perils of asbestos, new developments in cancer research, heart transplants and sports injuries.

In recent years, Bergman has also reported on solar, wind and nuclear energy, as well as the oil crisis, economic cars and mass transit.

Bergman will guest on the WTAR-AM-790 Radio Talk Show beginning at 8:10 p.m. Sunday, May 15.

The Public Lecture Series is sponsored by NASA and the College of William and Mary. Free tickets for the lecture are available by phoning 877-9231, ext. 60, by May [illegible] or at the Coliseum Box Office.

NOTE TO EDITORS: Bergman will give the same lecture at a Langley colloquium that afternoon in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15 p.m.

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RELEASE NO. 83-29

STUDENT SHUTTLE COMPETITION HELD AT NASA-LANGLEY

HAMPTON, Va.--Twenty high school students from Virginia and surrounding states met April 17 through 19 at the Langley Research Center to learn who will have the opportunity to have their experiments fly aboard the Space Shuttle.

The competition was part of the third National Space Shuttle Student Involvement Project, a joint effort of NASA and the National Science Teachers Association.

The objective of the project is to stimulate the study of science and technology in grades 9 through 12 by engaging students in a competition to develop payload experiments suitable for flight aboard the Space Shuttle.

The students from Virginia, North Carolina, South Carolina, West Virginia, Maryland and Washington, D.C., were amoung 200 semifinalists from across the country competing to have their

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experiments placed on the Shuttle. The experiments encompass a wide range of disciplines, including biology, chemistry, astronomy, physics, botany and medicine.

About 1,500 entries for the competition were received by the association. These proposals were grouped into 10 geographic areas or regions determined by the association. The students who met at Langley are from region three.

Interdisciplinary teams of teachers, scientists and engineers, selected by the association, reviewed the proposals at the 10 regional levels and selected 20 entries from each region for the semifinal competition.

According to Roger Hathaway, Langley's Office of Public Services, each student during the semifinals presented his experiment proposal to consultants, who assisted the students in improving their exeriments for the national competition. A panel of judges, including representatives from NASA, NSTA, the National Science Foundation, the National Institute of Health, Department of Education, the American Association for the Advancement of Science, and several universities and consulting firms, will then select the national winners.

The winning project will be chosen May 27 and will be based on scientific or engineering merit. The winners and their

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teachers will attend a special educational conference at the Kennedy Space Center in July.

Winning student experiments will be assigned to specific Shuttle flights as the experiments are ready, as Shuttle payload space is available and as future Shuttle flights are confirmed.

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RELEASE NO. 83-32

NASA-LANGLEY MANAGER NAMED DEPUTY DIRECTOR AT NASA'S JOHNSON SPACE CENTER IN HOUSTON

HAMPTON, VA.—Robert C. Goetz, Director for Structures at NASA's Langley Research Center, has been named Deputy Director of the NASA Johnson Space Center, Houston, Texas. His appointment will become effective July 1.

Goetz will replace Clifford E. Charlesworth, who has held the position since 1979. Charlesworth was made Director of Space Operations, one of three top management positions created in a recent reorganization at the Houston center.

Johnson's Director, Gerald D. Griffin, said the appointment of Goetz "adds strong technical leadership for our future research and development programs. At the same time, it allows Cliff Charlesworth to apply his extraordinary experience toward making the Space Shuttle a truly operational transportation system."

Goetz joined the Langley staff in July 1959, conducting research in hypersonic aeroelasticity in the Dynamic Loads Division. He was a U. S. Air Force officer from late 1959 to 1962, assigned to Langley.

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He served in increasingly responsible technical positions until 1979, when he was assigned to NASA Headquarters in Washington, D.C., to head structures and dynamics research. He returned to Langley in 1980 as Special Assistant to the Chief of the Structures and Dynamics Division, where he was in charge of advanced research. He was appointed Director for Structures in June 1980.

He first conducted structural research on the Space Shuttle during its design phase in the early 1970's.

Goetz was born in Miami, Fla. He received a bachelor of science degree in aeronautical engineering from Georgia Institute of Technology in 1959 and a master of science degree in engineering mechanics from Virginia Polytechnic Institute in 1967.

He is the author of more than 30 publications and presentations on hypersonic aeroelasticity, Space Shuttle dynmamics and aeroelasticity, dynamic loads and flutter. He has received several awards, including a Sigma Xi Award for his master's thesis and a 1981 NASA Exceptional Service Medal for "outstanding contributions to Shuttle technology and for direction of a broad range of analytical and experimental (thermal tile) certification efforts for STS-1 (the first Shuttle flight)."

He is an Associate Fellow of the American Institute of Aeronautics and Astronautics, and he recently completed the Federal Executive Institute in Charlottesville, Va.

Goetz, his wife, Josemarie, and their two children live in Williamsburg.

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RELEASE NO. 83-33

NASA TESTS NEW FABRICATION PROCESS FOR SPACE SYSTEM COMPONENTS

HAMPTON, VA.—Scientists at NASA's Langley Research Center are experimenting with a fabrication process for composites materials that one day may be used to manufacture components for large space structures and space transportation systems.

"Many space system components require long continuous structural lengths of very high specific strength," said Ian O. MacConochie, Vehicle Analysis Branch, Space Systems Division. "Therefore, we think this process may lend itself to the manufacture of components for future earth-to-orbit transportation systems and to ground or on-orbit manufacture of continuous members for large antennas, space platforms, space planes and other structures.

MacConochie explained that on-orbit manufacture is especially advantageous, since structural members would not be limited in length to that of the delivery vehicle's cargo bay.

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May 25, 1983

"We are experimenting now with new lightweight materials and new reinforcing fibers," Wilson said. He explained that a structural member made of fiberglass-reinforced polymer would be 78 percent lighter than steel, 37 percent lighter than aluminum, and stronger than structural steel. The same structure made of graphite fiber reinforcement would be even lighter and stronger.

Wilson said that Langley is the only NASA center developing the process, but that the Marshall Space Flight Center, Huntsville, Ala., is doing subcontract work in this area.

Pultrusion experiments have been conducted for the Materials, Fabrication, Space Systems and Structures and Dynamics divisions. The work for the Materials Division involved the pultrusion of thermoplastics reinforced with fiberglass.

The Fabrication Division is constructing lighter weight wind tunnel model components, such as wing spars, wing skins and stringers, which are made of fiberglass and polyester and can withstand the shock from various tests.

A demonstration model of a one-kilometer-long Kevlar reinforced cable is being fabricated for the Space Systems Division. The cable could be used to tow a structure from one orbit to another or as a tether to suspend experiments or spacecraft from the Shuttle or a space station in a high orbit to a lower orbit.

Experimental pultrusions have been made for the Structures Directorate from both polyester and thermoplastics reinforced with fiberglass. Robert Miserentino of the Structural Dynamics Branch is project engineer for the pultrusion of a 35-foot-long (10.66 meters) suspension beam to be used in dynamic tests of very low frequency members. The intended applications are model space booms, such as for the proposed

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Pultrusion has great potential for manufacturing component material parts for large space structures and space transportation systems. This process should have a strong influence on the way future space systems are designed and fabricated.

- end -

(NOTE: NASA-LANGLEY B/W PHOTOS L-82-9422 AND L-82-12,229 ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY CALLING JEAN SAUNDERS AT 804-865-3006.)

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RELEASE NO. 83-34

LANGLEY SCIENTISTS FLY ADVANCED REMOTE SENSING DEVICE

The most advanced laser atmospheric remote sensor in the world is now being flown onboard a NASA Electra aircraft, according to scientists at Langley Research Center, in Hampton, Virginia. The system, which has the unique capability to remotely measure gas and airborne particle concentrations in the lower atmosphere, is an important part of an evolutionary program aimed at developing a space borne atmospheric monitoring system.

Scientists believe that only a space borne platform can offer the necessary global coverage to effectively monitor the Earth's continually changing atmosphere. These changes, which are caused by interplay between the Sun, atmospheric gases and airborne particles, chemistry, and dynamic motions require continual observation for complete understanding.

Langley's system, the Differential Absorption Lidar (DIAL) is the most viable lidar — light detection and ranging system — technique for a space borne atmospheric monitoring system, which could be Shuttle- or satellite-based.

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May 27, 1983

According to Langley researcher, Dr. Ed Browell, "The DIAL technique is the most powerful method we have for measuring atmospheric gas profiles in the lower atmosphere from space. Another of DIAL's assets is that it is adaptable to new technology. As laser technology advances, new tuneable lasers can be incorporated into the framework of the DIAL technique."

The DIAL technique utilizes the basic strengths of a light detection and ranging system. The lidar system, a radar technique using lasers, operates by directing laser light into the Earth's atmosphere. The light is scattered by clouds, aerosols, droplets and even molecules in the atmosphere. This backscattered light is then collected in a receiving telescope at which time it is processed to provide scientists with information about gas and aerosol profiles present in the atmosphere.

The DIAL's unique adaptation of the lidar system utilizes two tuneable lasers which are directed sequentially into the atmosphere while the Electra is airborne. The pulsed laser radiation from one laser is tuned to be absorbed by the specific gas being studied, while the other laser is operated at a minimum absorption wavelength for the gas.

The backscattered light is collected by a receiving telescope and directed onto photomultiplier tubes, which in turn convert the returned light to a voltage. This signal is stored on magnetic tape to be processed later or displayed on a television monitor for the researcher's control of the experiment.

The absorbed - unabsorbed backscattered returns from the two laser pulses are compared to obtain the concentration of the specific gas being studied.

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DIAL, which can transmit high intensity pulses of light in the ultraviolet, visible and near infrared areas, can remotely measure either ozone, sulfur dioxide, nitrogen dioxide, water vapor, temperature or pressure. Particle backscattering measurements are taken simultaneously with the measurements for a specific gas.

The DIAL system currently flying is not fully automated. Since a Shuttle- or satellite-based lidar system would have to be fully automated, two French scientific research agencies, CNES and CNRS, are working with Lanlgey to develop an intermediate step between the present DIAL system and a Shuttle-based lidar system.

Their cooperative effort, which is unofficially referred to as ER-2 DIAL, will lighten DIAL insturmentation from its current 4,000 pounds to a lean 1,100 pounds. And most importantly, the new system will be fully automated. While this system is now in the engineering phase, once finished it will be flown on an ER-2 (advanced U-2) aircraft.

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RELEASE NO. 83-36

NASA-LANGLEY OFFERING STUDENT WORK PROGRAM

Hampton, Va.—NASA's Langley Research Center is offering 15 high school students an opportunity to work with NASA researchers for eight weeks this summer.

The Summer High School Apprenticeship Research Program, to be held June 20 through August 13, allow juniors and seniors with exceptional academic achievement and strong career objectives in science, mathematics or engineering the chance to work with an engineer or scientist in the student's career interest area.

The Langley program, funded by NASA Headquarters in Washington, D.C., is a career exploration program which provides a real work experience in a student's interest area, an opportunity to see the applications of many concepts studied in the classroom and opportunities to gather information about related career areas which might reinforce or broaden a student's career objectives.

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RELEASE NO. 83-37

NASA-LANGLEY TO HOST GOVERNOR'S SCHOOL FOR GIFTED

Hampton, Va.—The Langley Research Center is one of four locations in the state of Virginia selected to host the 1983 Governor's School for the Gifted.

The Governor's School was established in 1973 to provide intellectually challenging and enriching experiences for a limited number of rising junior and senior high school students who are academically gifted and/or artistically talented.

This is the second year Langley has participated in the program, which includes a curriculum specially in engineering, mathematics and computer science. There are approximately 425 students participating in the school this year with 25 being assigned to Langley. The other school locations are Longwood College, Farmville, Va.; Mary Washington College, Fredericksburg, Va.; and Randolph-Macon Woman's College, Lynchburg, Va.

For the six-week program, June 20 through July 29, students will be housed at Hampton Institute where two NASA employees will act as chaperones during the evenings and weekends. During the 40-hour work week, the students' curriculum will include classes, seminars, workshops and independent studies which relates to various NASA

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programs. Each student will be assigned to a NASA scientist or engineer who will act as a mentor. Students are required to present weekly talks to their peers on their experiences. At the close of the school, each student will receive a Certificate of Commendation.

The Governor's School participants were selected by the State Department of Education from over 600 students nominated by high school principals and teachers. Selections were made based on grade point average, extra curricular activities, teacher recommendations and a written paper.

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RELEASE NO. 83-39

BLANKENSHIP NAMED DIRECTOR FOR STRUCTURES AT NASA-LANGLEY

HAMPTON, VA.—Charles P. Blankenship, Chief of the Materials Division at NASA's Langley Research Center, has been selected as Director for Structures at the center. His appointment will become effective July 1.

He will replace Robert C. Goetz, who has been named Deputy Director of the Johnson Space Center in Houston, Tex.

Blankenship will manage all research work in materials, structural mechanics, aeroelasticity and acoustics and noise reduction. He will direct the work of approximately 260 people.

Langley's Director, Donald P. Hearth, said "Charlie Blankenship has done an excellent job in the Materials Division. He will make a fine program director. I am sorry Bob Goetz is leaving Langley, but the JSC job is a fine opportunity for him. We wish him the very best."

Blankenship began his NASA career at the Lewis Research Center in Cleveland, Ohio, in 1961. He was a U.S. Air Force officer, assigned to Lewis, until 1964. From then until 1968 he was a materials engineer conducting fabrication development projects for nuclear propulsion system components.

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June 15, 1983

He was appointed Head of the Materials Processing Section in 1968, Head of Materials Projects Section in 1972, Chief of the Materials Applications Branch in 1977 and Chief of the Materials Applications and Composites Branch in 1979. In these positions at Lewis, Blankenship was involved in management of material technology programs for various power and propulsion systems, including high-temperature super alloys for aircraft turbine engines, structural ceramics for automotive turbine engines and high-temperature iron alloys for automotive stirling engines, and for research in polymer and metal matrix composite materials.

In July 1980 Blankenship transferred to Langley as Chief of the Materials Division.

Blankenship was born in Bluefield, W. Va. He received a bachelor of science degree and a master of science degree in metallurgical engineering from Virginia Polytechnic Institute and State University in 1960 and 1962.

The author of over 20 technical papers on high-temperature materials and their applications, Blankenship is a member of the American Society for Metals.

He and his wife, Gayle, have two sons. They live in Poquoson, Va.

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RELEASE NO. 83-41

NASA-LANGLEY RESEARCHER RECEIVES INTERAGENCY COMMITTEE AWARD

HAMPTON, VA.—A NASA-Langley Research Center scientist has been presented an award by the Interagency Committee on Automatic Data Processing for outstanding achievement and contribution to the federal information resources management community.

Dr. L. Bernard Garrett, a systems analyst in the Systems and Experiments Branch, Space Systems Division, was one of nine federal employees selected to receive an award for 1983.

Recognized for his technical excellence in automatic data processing, Garrett's award citation read, "Dr. Garrett is recognized for developing an interactive computer-aided design system whereby aerospace engineers can use large amounts of technical data to design and analyze advanced space systems such as large antennas for communications. This system allows development of a rapid, efficient, and cost-effective technology for future U.S. civilian, commercial, and military space missions."

Garrett began his NASA career in June 1962 as as aerospace engineer. For the last several years, he has concentrated his research on the development and use of interactive computer-aided design capabilities for the design and analysis of large Earth-orbiting spacecraft. He conducted research in the thermal and fluid mechanics areas for

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July 11, 1983

high-speed reentry spacecraft from 1962 to 1970, and managed the development and operations of several science analysis processing systems for the Viking Project Mission to Mars from 1971 to 1976.

Garrett received bachelor and master of science degrees in mechanical engineering from Virginia Polytechnic Institute and State University in 1962 and 1968, respectively. He earned a doctorate degree in mechanical and aerospace engineering from North Carolina State University in 1971.

The recipient of several NASA awards, including the NASA Exceptional Service Medal for his contributions to the Viking Project, Garrett is a member of the American Institute of Aeronautics and Astronautics. He is the author or co-author of over 30 technical publications.

Garrett and his wife, Judy, live in Yorktown, Va. They have three children.

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NASA News

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25th Anniversary
1958-1983

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Upon Receipt

RELEASE NO. 83-42

STUDENT FROM LANGLEY'S REGION WINS SSIP AWARD

HAMPTON, VA.—Rachel M. Safman, a student at Montgomery Village Junior High School in Gaithersburg, Md., is one of 10 science students to be named national winners in the 1983 Space Shuttle Student Involvement Project, conducted by the National Science Teachers Association and NASA.

Safman was one of 20 students from region three, which includes Virginia, North Carolina, South Carolina, West Virginia, Maryland and Washington, D.C., who met at NASA's Langley Research Center this past spring to compete for the opportunity to have her experiment fly aboard the Space Shuttle. Her experiment is titled "Argon Injection in Gallium as an Alternative to Honeycombing."

The 10 winners and their teacher/advisor will attend a three-day conference in Washington, D.C., July 26-29. Receptions, meetings with NASA officials and Shuttle mission reports will be highlights of the conference.

During the conference, the national winners will present their projects to NASA and NSTA officials and the press Wednesday, July 27, at NASA Headquarters. (Winning projects become the property of NASA and will be considered for flight aboard future space shuttles.)

- more -

July 11, 1983

NSTA's involvement in the Shuttle student experiment program—now in it's third year—includes mailing of entry materials to secondary schools and coordinating the science education aspects of the project. Each entrant has a teacher/advisor for his or her project. A NASA technical person works with them in cases where a winner's project is chosen to be flown on the spacecraft.

NSTA appoints regional directors (leading science educators) who receive entries and determine the submitted proposals' acceptability in accordance with the official project rules. Regional and national judging is done by panels of educators, scientists and engineers from agencies such as NASA, NSTA, the National Science Foundation, the National Institute of Health, Department of Education, the Amaeican Association for the Advancement of Science, and several universities and consulting firms.

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For Release:
July 27, 1983

RELEASE NO. 83-48

ADVANCED PASSENGER TRAINS DISCUSSED AT NASA-LANGLEY COLLOQUIUM

Hampton, Va.—In recent years high speed trains have successfully revitalized railway services in many countries. One approach, which has been followed by British Railways, has been to develop advanced trains that can run on existing tracks, according to Dr. Alan H. Wickens of the Railway Technical Centre in Derby, England.

Wickens will discuss "Creating the Advanced Passenger Train" at a NASA-Langley colloquium Monday, August 8. The lecture will be held in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15 p.m.

In his lecture, Wickens will examine the technical problems of high speed train operation, particularly in the field of vehicle dynamics and will show how the scientific approach, familiar to aerospace engineers and scientists, has led to significant progress.

Wickens joined British Railways Research Department in 1962 as Head of the Dynamics Section, where he initiated a fundamental research program into the dynamics of railway vehicles. The success of this research resulted in the 1968 approval for the advanced passenger train and Wickens was appointed Director of Advanced Projects to lead the development team. In 1976 he was appointed Director of Laboratories

- more -

responsible for mechanical, electrical and civil engineering and scientific research. He was chairman of a committee on research into interaction between vehicle and track at the Office of Research and Experiment of the International Union of Railways from 1970-78.

Wickens was awarded honorary degrees of Doctor of Technology by the Council for National Academic Awards and a Doctor of Science at Loughborough University of Technology in 1978.

He has worked with Sir W.G. Armstrong, Whitworth Aircraft Ltd.; Canadair Ltd.; and A.V. Roe and Co., Ltd., on structural dynamics and aeroelasticity of aircraft and missiles.

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For Release:
July 29, 1983

RELEASE NO. 83-49

NASA DEPENDENTS RECEIVE NASA COLLEGE SCHOLARSHIPS

Hampton, Va.—James Odis Pendergraft, son of Mr. and Mrs. Odis C. Pendergraft of Newport News, is one of two NASA dependents to receive scholarship awards from The NASA College Scholarship Fund, Inc. The $1,500 renewable college scholarships were made possible by an endowment from Pulitzer Prize winning author, James Michener.

This past spring The NASA College Scholarship Fund, Inc., a Texas non-profit organization, was established to award scholarships to qualified dependents of NASA and former NASA employees. Three hundred ninety-seven applications were received and the top 20 candidates were recommended to the Board for selection. The other recipient is Paul A. Schliesing, son of Mr. and Mrs. John A. Schliesing of Houston, Texas.

Michener gave two reasons for his generous gift to NASA employees—The first, he holds the people of NASA in high esteem for their good work through the years and, the second, he thinks it is important for education to go forward in this country.

The two NASA dependents will use their scholarships to further their education in the fall. Schliesing, whose father is assigned to the Structures Division at the Johnson Space Center, graduated first in his class with a 4.0 grade point average. He will attend Texas A&M where he will study science and mathematics. Pendergraft, whose father is

- more -

an aerospace engineer in Langley's Transonic Aerodynamics Division, graduated second in his class with a grade point average of 3.95 and will study computer engineering at Virginia Polytechnic Institute.

Pendergraft has won highest honor awards in history, French, English, religious studies, advanced biology and advanced calculus. He received an award from the Engineers' Club of the Virginia Peninsula as the most promising engineering student from Peninsula Catholic High School. He was editor-in-chief of the school yearbook, president of the National Honor Society, city treasurer and Boys Nation nominee in the 1982 Boys State and is included in "Who's Who Among American High School Students" and "America's Outstanding Names and Faces." He is also an Explorer Scout, a National Merit Scholarship finalist and recipient of two merit scholarships.

The two scholarships are renewable each academic year to a maximum of $6,000 over six calendar years. Additional scholarships are expected in future years.

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Maurice Parker
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August 5, 1983

RELEASE NO. 83-53

NASA-LANGLEY RESEARCH CENTER SELECTS MODEL MAKER

HAMPTON, Va.—Dynamic Engineering, Inc., of Newport News, Va., has been selected for negotiation of a contract to design and build precision wind tunnel models for research and development programs at NASA's Langley Research Center.

The cost-plus-award-fee contract is expected to begin in September 1983 and operate for two years. The total contract work is valued at approximately $4 million. Langley will also have options to extend the contract for an additional three years.

The precision models will be used for a variety of basic research in Langley wind tunnel test programs. Wind tunnel models are used to simulate flight conditions in all speed ranges, from below the relative speed of sound (subsonic) to as much as 10 times the speed of sound (hypersonic). In a wind tunnel, a moving stream of air flows over a stationary model to simulate an aircraft flying through an air stream.

The contractor may be responsible for any or all aspects of the models and support equipment, from design through fabrication, assembly and calibration, plus installation of instrumentation and analysis equipment that supports model tests.

The models will vary in size and complexity, but all must be built with extremely precise tolerances and degrees of surface smoothness. Most models will be tested near ambient temperature, but some must withstand test environments as cold as minus 320 degrees F. and as hot as 2000 degrees F.

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August 12, 1983

RELEASE NO. 83-54

NASA Sponsors Conference on Optical Information Processing

Hampton, ~~Va.~~—The second biannual conference on Optical Information Processing for Aerospace Applications will be held at NASA's Langley Research Center August 30-31. The conference is sponsored by NASA's Office of Aeronautics and Space Technology in Washington, D.C., and Langley.

Over 100 engineers and scientists from government, industry and the academic community are expected to attend the sessions on optical data processing concepts, optical components and material technology, optical data processing circuits, and optical data processing functions and processors.

Conference objectives are to bring optical data processing and aerospace systems engineers and scientists together to discuss current optical data processing technology and its continued potential in future aerospace applications, and to identify new research directions and potential applications to enhance the national position in advanced aerospace data system technology.

More than 25 papers will be presented during the conference, covering topics that include optical matrix operations, optical pattern recognition, incoherent optical processing, acousto-optical signal processors, integrated active optical devices, light valves and recognition of statistical patterns.

- more -

Dr. Donald P. Hearth, Director of the Langley Research Center, will welcome attendees at 8:30 a.m. in the NASA Activities Center, Building 1222. The keynote address, "Future Directions of Optical Processing," will be given by Dr. John A. Neff, formerly with the Air Force Office of Scientific Research and now with the Defense Advanced Research Projects Agency in Alexandria, Va.

The conference is open to anyone interested in optical processing. Registration will begin at 8 a.m. August 30 in the Activities Center lobby. The registration fee is $5. Reservations are being handled by Arlene Mitchell, 865-3777.

The conference chairman is Robert L. Stermer and program chairman is Carl J. Magee, both of Langley's Instrument Research Division.

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For Release:

August 12, 1983

RELEASE NO. 83-55

NASA Holds Workshop on Advanced Materials/Structures Technology for Rotorcraft

Hampton, Va.—The Langley Research Center will host a Workshop on Advanced Materials/Structures Technology for Rotorcraft August 17-19. The three-day conference is being held at the request of the Informal Subcommittee on Rotorcraft Technology of the NASA Advisory Council—Aeronautics Advisory Committee.

Approximately 35 specialists from five helicopter companies, the Army Applied Technology and Structures Laboratories and NASA will meet in the Langley Activities Center, Building 1222, to discuss potential improvements for the next generation rotorcraft (1990s), defining key technology areas necessary to obtain the improvements and mechanisms to develop the key technology. The objective of the workshop is to obtain recommendations from the rotorcraft industry and the Army that can be used to guide future planning of NASA rotorcraft programs.

Robert J. Huston, Acoustics and Noise Reduction Division, and Benson Dexter, Materials Division, will be co-chairpersons for the workshop.

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For Release:

August 15, 1983

RELEASE NO. 83-56

LAMAR RECEIVES AIAA AERODYNAMICS AWARD

Hampton, Va.—Dr. John E. Lamar, an aerospace engineer in the Transonic Aerodynamics Division at NASA's Langley Research Center, has received the Aerodynamics Award for 1983. The American Institute of Aeronautics and Astronautics presents the award "for meritorious achievement in the field of applied aerodynamics recognizing notable contributions in the development, application and evaluation of aerodynamic concepts and methods."

The certificate of citation presented to Lamar reads, "for developing aerodynamic analysis and design methods for wings having strong leading-edge-vortex flow and for developing and experimentally verifying favorable shaping of wings and strakes to exploit vortex flow for performance improvement." Given to Lamar at the AIAA's first Applied Aerodynamics Conference in Danvers, Mass., July 13, the award also consists of a medal and rosette pin.

A member of the Langley staff since 1963, Lamar leads the Vortex Flow Aerodynamics Group in the NTF Aerodynamics Branch. He is an international expert on the leading-edge suction analogy and its applications to configurations with leading-edge separation-induced vortex flows. In 1977 he developed the first design method in the United States for slender wings with leading-edge vortex flow, and produced a breakthrough in applying the vortex flow design to a tactical supercruiser.

- more -

A transonic experiment in 1978 verified his design to control the vortex-induced suction pressures which act on the forward facing wing surface to produce thrust, and hence substantially reduce drag and increase aerodynamic performance.

In 1978 Lamar developed practical analysis methods to estimate the forces and moments on wings and strakes which have leading-edge vortex flows at high angle-of-attack conditions and directed the experimental studies which validated the methods. These vortex techniques are widely used by NASA, military, industry and university aerodynamicists, and consequently Lamar is a frequent consultant.

From 1979-81 Lamar pioneered the development of a design method for obtaining optimum strake shapes to exploit vortex flow for favorable performance improvements, and carried out water and wind tunnel tests to verify the design techniques.

Lamar received bachelor of science degrees in aeronautical and mechanical engineering from the University of Alabama in 1962 and a master of science degree in aeronautical engineering from Alabama in 1963. He earned a doctorate degree in aeronautical engineering from Virginia Polytechnic Institute and State University in 1973.

The author or co-author of over 50 technical reports and presentations, Lamar presented a paper last April at the AGARD Symposium on Vortical Type Flows in Three Dimensions held in The Netherlands, where he reviewed NASA Langley research in vortex flow aerodynamics. He holds a patent for a "Vortex-Lift Roll Conrol Device" and is an Associate Fellow of the AIAA.

Lamar and his wife, Joyce, live in Newport News. They have two children.

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For Release:

Katherine Edwards
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August 22, 1983

RELEASE NO. 83-58

NASA PERSONNEL FILL TEMPORARY POSITIONS

William L. Williams, chief of the personnel division at NASA's Langley Research Center, will leave his present job at the end of this month to teach at Hampton Institute for the next academic year.

Williams will be working under the Intergovernmental Personnel Act (IPA) which permits the assignment of federal employees to state and local colleges and universities, as well as certain other organizations and vice-versa.

Hampton Institute has received the services of loaned executives over the past few years from IBM, DuPont, Dow Chemical and other companies for a one to two year period. Williams will serve as NASA's visiting professor of personnel management.

Having taught in George Washington University's graduate program in management studies since 1966, Williams will teach a full course load of personnel administration and general management courses. He will also assist in such areas as career days, inviting seminar speakers, developing additional cooperative efforts with community organizations, counseling business school students on possible career and specific course options and working with graduating seniors to assist them in their placement with the private and public sectors.

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Sidney F. Pauls, staff assistant to the Langley director since 1980, will take Williams' place. Pauls began his career at Langley in 1963 working on various space related projects before becoming head, analysis and planning group, programs and resources division; head, analysis and programming branch, business data systems division; then assistant chief of that division. He was assistant chief of the programs and resources division from 1976 to 1980. In August of 1980, upon his return from a special assignment at NASA Headquarters in Washington, D.C., he was named to his present position.

At the end of May 1984, Williams will resume his position at Langley.

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For Release:

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September 9, 1983

RELEASE NO. 83-61

WHITEHEAD CHOSEN AS DIRECTOR'S STAFF ASSISTANT

HAMPTON, Va.--Dr. Donald P. Hearth, director of NASA's Langley Research Center in Hampton, Va., has chosen Allen H. Whitehead, Jr., as his staff assistant. Whitehead is former technical assistant to the director for aeronautics.

In his role as staff assistant, Whitehead will be responsible for assisting the director and deputy director in planning, coordinating and directing the center's research programs.

Whitehead began his NASA career in July 1962 as an aerospace engineer conducting experimental research in hypersonic aerodynamics and fluid mechanics. From 1972 to 1973 he participated in a management training program where he served as a technical assistant to the director for aeronautics. In that position he was responsible for participating in the coordination and management of four research divisions and a project office.

In 1973 Whitehead joined the aeronautical systems division where he directed NASA's air cargo systems studies. He was responsible for conducting and coordinating in-house and contracted systems design studies and research and technology activities; directing market analyses; initiating and maintaining liaison with the Department of Defense, the Department of Transportation, airframe manufacturers, airlines, air freight forwarders and others in the air cargo field; and providing general guidance and advocacy to the program.

- more -

In 1979 Whitehead became technical assistant to the director for aeronautics where he assisted in all technical and administrative duties, monitored and evaluated progress of on-going research, served on a number of ad hoc committees involving technical and management decisions and was responsible for personnel functions associated with a staff of 300 employees.

Whitehead was born in Wilmington, N.C. He received a bachelor of science degree in mechanical engineering from Princeton University in 1961 and a master of science degree in aerospace engineering from the Univesity of Virginia in 1965.

He is the author of numerous technical publications on fuel-saving concepts for transport aircraft, advanced transport designs and hypersonic aerodynamics and flow phenomena.

Whitehead and his wife, Pat, live in Yorktown,Va. They have two sons and a daughter.

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For Release:

September 26, 1983

RELEASE NO. 83-62

NASA-LANGLEY EARNS TWO IR-100 AWARDS FOR 1983

Hampton, Va.—Two NASA-Langley Researcher Center engineers have received awards in the 1983 IR-100 competition for developing two of the 100 most significant new technical products of the year.

Charles J. Camarda, an aerospace engineer in the Loads and Aeroelasticity Division, along with Algerd Basiulis of Hughes Aircraft Company, developed "Heat-Pipe Sandwich Panels." Harlan K. Holmes, an aerospace engineer in the Instrument Research Division, developed a product called a "Non-Contacting Suction Force Generator."

The IR-100 award is presented annually by the Industrial Research and Development magazine to 100 scientists or engineers who have contributed the most significant products for advancing science and technology during the year. Selections are made by a panel of scientists and engineers after studying new technology around the world.

Camarda's device was developed to solve thermal stress problems in Langley's Airframe-Integrated Scramjet Engine. Excessive thermal stresses result from large transient temperature gradients across the honeycomb sandwich walls of the engine structure during engine start-up and shutdown, causing premature engine failure.

- more -

Camarda's heat-pipe concept can drastically reduce transient temperature differences with a modest increase in mass over the original, unacceptable non-heat-pipe design. This exceptional performance is possible because the integral heat-pipe sandwich panels synergistically combine the thermal efficiency of heat pipes with the structural efficiency of honeycomb sandwich construction.

Camarda says the primary functions of the panels are to reduce thermal gradients, distortions and stresses in heated honeycomb sandwich structures and simultaneously transport large quantities of heat over long distances without the need for external pumping. The sandwich panels consist of two different wickable honeycomb cores, facesheets with screen mesh sintered to the internal surfaces, and potassium or sodium as the working fluid. The simple machine-welded, fabrication method eliminates possible compatibility problems with bonding agents and provides an inexpensive method for fabricating flat-plate heat pipes.

The panels add a new dimension to the design of lightweight structures subjected to thermal load and stimulates a new heat-pipe design philosophy. Camarda explained that structurally efficient heat pipes are a feasible solution to many current and future thermal/structural problems and should be used more for such applications.

Camarda said the panels may ultimately have a variety of uses, including cold plates to cool electronic components, radiators to dissipate heat from space stations and space antennas, and to cool the leading edge of re-entry vehicles.

Langley's second IR-100 award for 1983 was presented to Holmes for developing a device to investigate the integrity of the bonding interface between the Space Shuttle's metallic skin and its ceramic thermal protection tiles.

The non-contacting suction force generator functions by requiring that a high velocity fluid be constrained to flow radially between a radial diffuser and a flat surface located 1/16 to 1/8 inch apart, explained Holmes. A negative pressure, or suction, is

- more -

created between the two surfaces and an attractive force is generated. Holmes said that by controlling such factors as plate separation, diffuser diameter, fluid velocity and flow duration, a variety of force conditions can be created. Surface contours other than flat also can be accommodated to provide lateral force components.

Other applications include conveying or positioning articles where physical contact is not desirable or for non-destruction investigations of material bonding integrity.

Holmes said this device is a unique application of a well-known physical phenomenon, that of trading velocity pressure for static pressure. "Through this phenomenon, one can exert relatively large pulling or suction forces without contacting the object under investigation. There is no known device that has this advantage and, as such, (it) represents a new tool in the non-destructive testing area," Holmes said.

In the past 16 years of NASA's participation in the IR-100 competition, 55 NASA developments have been selected, contributing significantly to the recognition of NASA as one of this country's centers of technical excellence. Langley has earned 10 of NASA's 55 awards and the Lewis Resesarch Center leads with 40 awards.

The IR-100 winners were honored at an awards banquet at the Museum of Science and Industry in Chicago September 22. The banquet marked the beginning of a month-long exhibit of products to be viewed by scientists, engineers, educators and the general public.

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For Release:

October 7, 1983

RELEASE NO. 83-63

STEPHENS NAMED NASA ASSISTANT CHIEF AND ACOUSTICS FELLOW

Hampton, Va.—A manager at NASA's Langley Research Center has been recognized by two organizations for his work in acoustics and noise reduction.

David G. Stephens has been designated Assistant Chief of the Acoustics and Noise Reduction Division at Langley and named a Fellow of the Acoustical Society of America. Stephens is former Head of the Structural Acoustics Branch in the division and replaces Donald L. Lansing, who has accepted a position in the Analytical and Computation Division.

In his new position at Langley, Stephens will assist and support the ANRD division chief in managing the division to achieve its research goals of understanding, predicting and reducing noise sources on aircraft; predicting the total system noise from subsonic and supersonic transports, rotorcraft and general aviation aircraft; understanding quantifying and predicting human response to noise for aircraft design and certification purposes and airport community noise control; and controlling the noise received by passengers and crews inside aircraft.

In elevating Stephens to the position of Fellow, the ASA recognized him for his "contributions to understanding the effects of noise on people and structures."

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Stephens joined the Langley staff in 1959 as an aerospace engineer, specializing in fluid mechanics, vibration, acoustics and structural dynamics. He was appointed Head, Environmental Systems Section in 1969. From March 1970 to June 1971 he attended Stanford University as a Sloan Fellow. In 1971 he returned to Langley as Head, Structural Dynamics Branch, and in 1972 he became Head, Noise Effects Branch.

A native of Sayre, Pa., Stephens graduated from Sayre Area Joint High School in 1955. He received a bachelor of science degree in mechanical engineering from Lafayette College in 1959 and a master of science degree in engineering mechanics from Virginia Polytechnic Institute and State University in 1961.

The author of over 70 tehnical papers and journal articles and the holder of four patents, Stephens is a member of the American Institute of Aeronautics and Astronautics and the Acoustical Society of America and the Institute of Noise Control Engineers.

Stephens, his wife, Janet, and their two children live in Yorktown, Va.

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NASA News

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For Release:

October 6, 1983

H. Keith Henry

Release No. 83-65

NASA STUDIES EFFECTS OF LIGHTNING ON AIRCRAFT

After more than 700 storm cloud penetrations and 400 direct lightning strikes to a specially-instrumented jet airplane, scientists at NASA's Langley Research Center, Hampton, Va., are beginning to understand more about lightning at flight altitudes and how it effects aircraft and aircraft flight.

Today's airliners are struck by lightning more than 2,000 times each year, or about once per airline aircraft, with little effect. These aircraft are protected by their aluminum skins, which are natural conductors, and by the use of mechanical-hydraulic control systems which are immune from the electromagnetic effects of lightning.

Future aircraft skins, however, may be made of composite materials, which are non-conductors, and may need some form of additional protection from lightning. Lightweight composite materials — woven fibers impregnated with epoxy resins — promise a substantial savings in fuel expenditures and reduced operating costs.

Future aircraft also will use electronic control systems and digital avionics systems for improved flight efficiency and further savings of weight and fuel. However, lightning protection techniques need to be defined to avoid possible damage or upset to these low-voltage, highly sensitive electronic systems.

It had been generally accepted that lightning activity is concentrated in a narrow altitude range where the air temperature is at or near the freezing level. Aircraft that encountered storms were usually advised to fly above this level — above 4,600 meters

- more -

(15,000 ft.).

Recent aviation articles have suggested that pilots avoid flying in temperatures between 0 and -5 Celsius (32 and 23 Fahrenheit) when the atmosphere is electrically charged. Records kept on lightning strikes to aircraft indicate that this is where most strikes occur.

This information can be misleading, however, as explained by Langley's Norman Crabill, Storm Hazards project manager: "Most strikes occur at low elevations (3,050 to 4,600 m — 10,000 to 15,000 ft.) because there is a lot of traffic there and deviations around storms are restricted by air traffic control and the need to depart or approach the runway location. At higher altitudes (7,600 to 9,150 m — 25,000 to 30,000 feet), deviations around storms are the rule and, hence, there is less exposure to the hazard."

Flights by the Storm Hazards F-106B into thunderstorms at various altitudes indicate that, although some lightning strikes at lower altitudes may be stronger and pack more punch, lightning strikes at higher altitudes seem to occur more frequently.

In 1980 and 1981, flying near the freezing level, the aircraft took "only" 10 hits each year. In 1982, flying at higher altitudes, Crabill's team logged more than 150 direct hits. In the 1983 storm season, flying at these same higher altitudes, the team reports more than 250 direct strikes to the airplane.

Langley researchers are also learning more about the fundamental characteristics of lightning, perhaps the single most important element of the Storm Hazards program. The physics of lightning has been studied for years by many scientists, but relatively little is known about lightning at typical operating altitudes of airliners.

Felix Pitts of Langley's Fault Tolerant Systems Branch is principal investigator for the Direct Strike Lightning Experiment, which can record more than one million individual measurements of the characteristics of each lightning strike.

Though much is yet to be learned about the internal micro-mechanisms of lightning, Pitts has already reported significant findings. "Current rates of rise that approach 100 billion amperes per second have been recorded on the F-106B nose boom, for example. Such data," Pitts says, "will be used by the technical community in establishing updated lightning protection criteria for aircraft."

Research in the Storm Hazards program at Langley and NASA's Wallops Flight Facility, Wallops Island, Va., is proceeding on a broad front, looking at all aspects of lightning pertaining to aircraft flight. The F-106B airplane also collects data supporting research studies of turbulence, wind shear, heavy rain effects and other storm factors.

For the next several thunderstorm seasons, the craft will continue to be flown purposely into selected thunderstorms with the intent of being struck by lightning — all in the interests of safe, efficient flight.

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(NOTE: NASA-LANGELY PHOTOGRAPHS L-83-2755 AND L-83-7590 ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY WRITING OR TELEPHONING KEITH HENRY AT AC 804-865-2934/2932. PLEASE SPECIFY BLACK & WHITE OR COLOR.)

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October 17, 1983

RELEASE NO. 83-67

NASA-LANGLEY STAFF MEMBERS RECEIVE ADVANCED DEGREES

Hampton, Va.—Twelve NASA-Langley Research Center staff members have received advanced degrees through the Center's Graduate Study Program during Fiscal Year 1983.

The program, established in the late 1940's, provides Langley scientists, engineers and administrators an opportunity to improve their proficiency in aeronautical and space research and earn advanced degrees while working at Langley. Approximately 840 employees have been awarded master's or doctoral degrees through the program.

Doctoral degrees have been awarded to the following two employees: Christine M. Darden, High-Speed Aerodynamics Division, Doctor of Science in Mechanical Engineering - Fluid Mechanics from George Washington University and Peter A. Gnoffo, Space Systems Division, Doctor of Philosophy in Mechanical and Aerospace Engineering from Princeton University.

The Professional Degree of Engineering has been awarded to Patricia W. Block, Acoustics and Noise Reduction Division, from George Washington University.

Master's degrees were awarded to the following nine employees: John R. Carlson, Transonic Aerodynamics Division, Master of Science in Mechanical Engineering from George Washington University; Panice H. Clark, Acquisition Division, Master of Public

- more -

Administration from Golden Gate University; Plesent W. Goode IV, Flight Dynamics and Control Division, Master of Science in Applied Science from College of William and Mary; Michael M. Hart, Flight Electronics Division, Master of Engineering (Electrical) from Cornell University; William D. Olstad, Facilities Engineering Division, Master of Engineering in Computer and Systems Engineering from Rensselaer Polytechnic Institute.

Thomas E. Pinelli, Research Information and Applications Division, Master of Science in Library and Information Science from Catholic University of America; Robert M. Thomas, Jr., Flight Control Systems Division, Master of Science in Applied Science - Computer Science from College of William and Mary; Jon E. Thompson, Facilities Engineering Division, Master of Science in Mechanical Engineering from University of Akron; and Thomas M. Moul, Low-Speed Aerodynamics Division, Master of Science in Aerospace Engineering from George Washington University.

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For Release:

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October 21, 1982

RELEASE NO. 83-68

NASA HONORS EMPLOYEES AT AWARDS CEREMONY

HAMPTON, Va.—NASA will honor employees who have made outstanding contributions in aeronautical and aerospace research during the past year at the Annual Honor Awards Ceremony at the Langley Research Center Friday, October 28.

John W. ~~Boyd~~, NASA Associate Administrator for Management, will be the guest speaker for the ceremony, which will begin at 1:30 p.m. in the Activities Center, Building 1222.

Boyd, Associate Administrator for Management since September, provides managerial direction involving all functional management and administrative matters, such as personnel, supply and equipment, facilities and computer support. He also provides managerial advice and support to the NASA administrator, deputy administrator and the program associate administrators.

NASA awards will be presented as follows:

Outstanding Leadership Medal: John E. Knemeyer and Gerald D. Walberg.

Exceptional Scientific Achievement Medal: Richard W. Barnwell, Wolf Elber, Joel S. Levine and Gino Moretti.

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Exceptional Engineering Achievement Medal: Edmund J. Conway and James C. Robinson.

Exceptional Service Medal: Malcolm P, Clark, James W. DeLauder, Billy L. Dove, William P. Henderson, Vivian B. Merritt, Martin M. Mikulas, J. Leroy Spearman and Harper E. Van Ness.

Group Achievement Award: 8-Foot Transonic Pressure Tunnel Flow Quality Improvement Team, Aerospace Vehicle Interactive Design Team, Fan Noise Flight Effects Research Team, Laminar Flow Control (LFC) Airfoil Model Systems Development Team, Light Aircraft Crash Test Team, and the Supersonic Low-Disturbance Wind Tunnel Research Team.

Langley awards will be presented as follows:

H.J.E. Reid Award: Stephen K. Park and Robert A. Schowengerdt of the University of Arizona.

Outstanding Voluntary Service Awards: Joe C. Gowdey, Ralph J. Muraca and Janet M. McKenzie.

Twenty Group Achievement awards will also be presented.

Boyd began his NASA career at the Ames Research Center in 1947 as an aeronautical research scientist and served in a variety of positions until 1979, when he was appointed Deputy Director of the Dryden Flight Reseach Center. He returned to Ames in 1980 as Associate Director and served additionally as the Acting Deputy Director.

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NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

Jean Saunders
(804) 865-3006

October 26, 1983

RELEASE NO. 83-72

NASA-LANGLEY APPRENTICES TO GRADUATE

HAMPTON, Va.—Fifty-seven Langley Research Center apprentices will receive their journeyman certificates Friday, November 4, at the 39th Annual Completion Exercises for Engineering Technicians.

The ceremony will begin at 1:30 p.m. in the Activities Center, Building 1222.

James H. Parks, former Assistant Director for Systems Engineering and Operations at Langley, will be the keynote speaker.

Delwin R. Croom Jr., Engineering Technician in the Fabrication Division, will be the speaker for the Class of 1983 and Malcolm P. Clark, Head, Training and Educational Services Branch, Personnel Division, will present the certificates.

The graduates and their trades are:

Engineering Technicians (Research Facilities Operations), Operations Support Division: James K. Geiger, Wanda Lynn Gresham, H. Stanley Hogge, John D. Johnston, Robert H. Kyle, Sharon E. Lowther, Joseph L. Murray, Kenneth M. Proctor, Stephanie A. Vay, Stanley W. Ward, Thomas F. Weston, Mark L. Whitaker, Fred M. Whitehead, Cheri L. Wood and Richard S. Young.

Electronics Technician, Instrument Research Division: Timothy D. Schott.

- more -

Engineering Technicians (Mechanical Development), Fabrication Division: Obediah Andrews Jr., Donald C. Athearn, Delwin R. Croom Jr., Robert L. D'Agostino Jr., Thomas J. Doneson, Curtis R. Horton, Gary D. Robbins and Henry N. Zumbrun.

Engineering Technicians (Aerospace Model Development), Fabrication Division: James D. Adkins, Keith L. Benson, William D. Castle, Daniel W. Fisher, Mark S. Griffith, Jane Manning Hogge, Mark I. Hudgins and Gary S. Johnson.

Engineering Technicians (Materials Processes), Fabrication Division: Maggie Berry, Carolyn J. James, Gilda A. Miner and Myra L. Walton.

Electronics Technicians, Flight Electronics Division: Franklin K. Harris and Bill B. Hefner Jr.

Electronics Technician, Analysis and Computation Division: Phillip T. Smith.

Electrical Engineering Technicians, Operations Support Division: Michael L. Carr, Thomas R. Levin, E. Miles Riley Jr. and Gary P. Stergin.

Electronics Technicians, Fabrication Division: Archie D. Dimery, Lonnie D. Hammonds and Bobby L. Hunt.

Electronics Technician, Flight Dynamics and Control Division: Kevin N. Barnes.

Electronics Technician, Flight Control Systems Division: Larry E. Johnson.

Engineering Technicians (Fabrication Development), Fabrication Division: James O. Johnson, Mark T. Lord, Tom E. Mitchell, James F. Pike and Norman F. Willey Jr.

Aerospace Engineering Technician: Michael G. Burroughs.

Parks, who retired from NASA in December 1979 after more than 37 years of federal service, assisted the Director for SE&O in managing the activities of five principal divisions: Fabrication, Operations Support, Systems Engineering, Research Facilities Engineering and Plant Engineering. The Systems Engineering and Operations Directorate is a multi-disciplined engineering and technical organization comprised, at that time, of over 1,100 Civil Service employees and a contract staff of approximately 450 employees, responsible for unique research and testing facilities valued at more than $350 million. Parks personally directed the center's formal design review system, chairing all major review committees for center spaceflight hardware/projects and ground-based facilities/facility support equipment.

Parks began his government career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in June 1946 as a researcher and later as a project engineer in the pioneering development of techniques for performing basic research on various phases of pilotless aircraft research and development. In 1957 he was appointed Head, Aircraft Configuration Branch, Pilotless Aircraft Research Division; in May 1962 Assistant Chief, Flight Vehicles and Systems Division; in July 1968 Technical Assistant to the Chief of Engineering and Technical Services, the forerunner of the SE&O Directorate; in October 1969 Chief of the Flight Vehicles and Systems Division; and in 1971 Assistant Director for SE&O.

In addition to Parks' technical and managerial achievements, one of his major accomplishments was in his interest in and development of new employees to enable them to reach their full potential. He served as a member and/or chairman of senior career development committees for many years and played a major role in the development of Langley's current middle management personnel. This interest was evidenced by his tenure on the Professional Entrance Training Review Committee, the Under Graduate Training Committee and the Apprentice Advisory Committee.

Parks, a native of Indiana, graduated from Purdue University with a bachelor of science degree in mechanical engineering. He has received numerous commendations and awards, including the NASA Exceptional Service Medal in 1977.

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NASA News

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H. Keith Henry

Release No. 83-87

For Release:
October 27, 1983

NASA PROBES 'INNER SPACE' WITH ULTRASONICS

Ultrasonic waves, passing through matter, can cause a barely perceptable change in the length of that matter, allowing important things to be learned about its physical properties~~, report~~ researchers at NASA's Langley Research Center in Hampton, Va.

High-frequency soundwaves — beyond the range of human hearing — when transmitted through a bolt that helps hold together an airplane's landing gear, for instance, can reveal a structural weakness not seen on the surface of the bolt. The same soundwaves may reveal that a bolt scheduled for replacement could safely remain in place, saving time and money.

NASA has a long history of working with materials — improving existing materials or developing new ones — for the nation's aerospace industry. One research group at Langley is using ultrasonic waves to look inside a material without damaging or disturbing the material in any way, a process called non-destructive evaluation.

Whether a critical fastener, a composite airplane wing, a concrete bridge support or a wall of granite in a mine shaft, the principle remains the same: Transmit sound into an object at one end and measure how the soundwave has changed as it passes out the other end.

Subtle changes in an object's makeup anywhere along the sound path can be detected, according to Dr. John H. Cantrell, who explains that these changes may

- more -

indicate an area of pent-up forces which, in some cases, means material defects. Cantrell is a physicist in the Instrument Research Division at Langley.

The division's work in non-destructive evaluation has already produced an award-winning monitoring device that measures external stress applied to a material. The device, called a bolt monitor, was primarily designed to provide highly precise measurements of the stress that occurs when a bolt becomes elongated in the process of tightening, somewhat analogous to measuring tone changes in a violin string being tightened.

Cantrell recently developed an analytical research tool that promises even broader uses for non-destructive evaluation. Dubbed a "nonlinear acoustic parameter," it mathematically links the behavior of a soundwave passing through a material to many significant properties of that material. For example, it links stress-induced changes in the speed of the soundwave to interatomic "binding" forces and naturally-occuring irregularities. In much the same way, distortion of the sound wave provides clues to the internal makeup of a material. He has shown, as part of this work, a connection between stress in the material and the dependence of the sound speed on changes in temperature.

Cantrell's newest finding builds on his earlier work. In a report to be published in a technical journal next year, Cantrell theoretically shows that a soundwave passing through a material produces a so-called "radiation pressure" similar to that produced by light waves falling on an object (as with the solar wind). Unlike light waves, however, acoustic radiation pressure is associated with distortion of the soundwave and production of harmonics (multiples of the original frequency) of the signal. The nonlinear acoustic parameter — which Cantrell had shown earlier to be tied to the inherent thermal properties of the material — enters dominantly in the calculations.

"The significance of this," Cantrell says, "is that it tends to link all these phenomona to a common origin, in a nice coherent way. It allows us to understand, more deeply, fundamental properties that can be exploited for practical applications."

Researchers as far back as 1910 believed that distortion of a soundwave was of neglible importance in the consideration of radiation pressure and did not enter this factor in their studies of material properties. "This is one of the oldest and most controversial subjects in acoustics. There are still technical articles appearing today that attempt to resolve a lot of the conflict associated with it. That is why I made redundant calculations," says Cantrell, "based on two entirely different approaches, from which I got exactly the same answer."

In a measurement breakthrough, another physicist in Langley's Instrument Research Division provided exciting verification of the nonlinear theory. Dr. William P. Winfree, achieved a significant research accomplishment — the first measurement of sound radiation pressure in practical engineering materials. He developed a series of exacting laboratory measurements that prove the predicted relationship between the distortion of soundwaves and radiation pressure.

For Cantrell's theory to be correct, all materials subjected to the radiation pressure of a soundwave must expand — even if barely perceptable and even if only for an instant — with one exception. The theory calls for glass, unlike all other known materials, to contract, and it was this knowledge that Winfree used to confirm his results. In the tests, aluminum samples (representative of a typical type of material) expanded, and glass samples contracted, as predicted.

"The newly-derived radiation pressure equation is significantly different," says Cantrell, "from the equation that is generally used for 'radiation pressure' calibration techniques for transducers used in both non-destructive evaluation and medical ultrasound. I believe the studies of our group will lead to significant improvements in instrumentation for monitoring damage to materials of all types."

The group's ultrasonic research typically takes place in the 1 to 10 million cycle-per-second range. Proposed for the future is work in the lower part of the ultrasonic range — primarily between 50 to 100 thousand cycles-per-second — for an in-depth look

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at composite materials. Lightweight composites, which are becoming increasingly important as materials in aerospace use, lend themselves well to acoustic analysis because they produce a great deal of harmonic distortions.

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AC 804 865-2934

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For Release:
November 7, 1983

RELEASE NO. 83-89

LANGLEY STAFF RECOGNIZED FOR SERVING NASA

HAMPTON, Va.--NASA employees are being honored this month in recognition of the contributions they have made to NASA during the agency's first 25 years.

A specially designed medallion, bearing the official anniversary logo and containing medal flown into space aboard the Space Shuttle Columbia, will be given to each employee.

Five hundred eighty-eight NASA-Langley Research Center employees who have continuously served the agency since its creation recently received special certificates for their contributions.

The accompanying citation read, "Presented in recognition of your dedicated and continuous service to the Agency since its creation. The pioneering spirit embodied in the original NASA team has underscored virtually every Agency accomplishment recorded during the last quarter century. It is this spirit that has established America's preeminence in aeronautical and space research, development and operational systems. And it is in this same spirit, with your continuing contributions, that the nation looks forward with confidence to future challenges in air and space research and exploration."

Employees qualifying for these awards were those who were officially on board October 1, 1958, and who have remained on board, with no break in NASA service, through September 1983.

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For Release:
November 7, 1983

RELEASE NO. 83-90

SHEETS HEADS NASA EQUAL OPPORTUNITY PROGRAMS OFFICE

HAMPTON, Va.—R. Thayer Sheets of Yorktown has been named Head of the Office of Equal Opportunity Programs at NASA's Langley Research Center.

Formerly a personnel staffing specialist in the Staffing and Special Programs Branch, Personnel Division, Sheets replaces Robert B. Lee III, who has accepted a position in the Atmospheric Sciences Division.

In his new position, Sheets will be responsible for monitoring and coordinating the center's Equal Opportunity Programs, including the Affirmative Action Plan, Hispanic Employment Program and Federal Women's Program, and administering the Discrimination Complaints System.

Sheets began his NASA career in April 1963 as an employee development assistant, responsible for planning, developing and administering the professional intern training program. In July 1966 he was appointed the center's awards program officer, responsible for center-wide personnel, educational and management award recognition programs. He assumed additional responsiblities in March 1967 as the awards liaison officer between the Langley and NASA Headquarters Inventions and Contributions Board.

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In December 1969 he became an administrative specialist in the Manpower Analysis Branch, independently conducting manpower analysis studies of center operations and activities entailing coordination with other centers and NASA Headquarters organizational elements. Since March 1971 he has been concentrating on college recruiting, administering the Disciplinary and Adverse Actions Program. He previously has administered the center's Performance Rating Plan, Leave Administration Policy and Procedures, Within-Grade Pay Increase Program, Merit Promotion Program and the Competitive Placement Plan.

Prior to joining NASA, Sheets was assistant director, West Virgina Department of Employment Security, where he determined manpower and special recruiting needs of various state-wide industries in West Virginia.

A native of West Virginia, Sheets received a bachelor of science degree in psychology from the University of Virginia in 1961 and a master of science degree in management from George Washington University in 1966.

Sheets participated in the Federal Executive Institute Symposium for Young Professionals in 1970. He received a Langley Equal Employment Opportunity Award in 1982, a Group Achievement Award in 1980 and a Special Achievement Award in 1976. He is a life member of the American Numismatic Association.

Sheets and his wife, Betty, live in Edgehill. They have two sons.

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AC 804 865-2934

H. Keith Henry

For Release:
November 8, 1983

Release No. 83-91

ELECTRONIC ADVANCES USED FOR 'DESK TOP' COCKPIT SIMULATOR

A futuristic aircraft cockpit simulator — which looks more like a set from a space movie than a research tool — is being incorporated into flight simulation facilities at NASA's Langley Research Center, Hampton, Va.; the Ames Research Center, Mointain View, Calif., and Lockheed-Georgia, Marietta, Ga.

When linked with advanced air traffic control system computer models, these simulators will provide full mission capabilities for researching issues that will affect transport aircraft flight stations and crews by the mid 1990's.

The unique desk top simulator design uses the latest improvements in electronics to help the pilot and crew become effective managers of increasingly complex aircraft flight systems. The design represents a three-year effort involving mission analysis, technology forecasts, preliminary design and pilot evaluation in 'soft' mockup.

Until recently, explains Samuel A. Morello of Langley's Flight Control Systems Division, aircraft flight station designs have evolved through the incorporation of improved or modernized controls and displays for individual systems. New displays and controls have simply replaced outmoded units.

"Coupled with a continuing increase in the amount of information displayed," Morello says, "this process has, in many instances, not only produced a complex and cluttered conglomeration of knobs, switches, indicators and electromechanical displays, but has frequently contributed to a high crew workload, missed signals and

- more -

misinterpreted information.

"Now, however, advances in electronic technology offer new concepts in flight station design which provide for safer and more efficient system operations by reducing clutter and through an orderly flow of information controlled by the flight crew."

The simulator's row of five cathode ray tubes, aligned left-to-right at the rear of a nearly flat control surface, are programmable so that flight information may be displayed in a logical, easy-to-see format. Traditional columns and wheels have been replaced by less bulky side stick controllers, which makes room for the desk top design and increases the pilot and copilot's field of view.

All three simulator facilities are expected to begin operations early next year. Capabilities will grow through succeeding years as researchers gain experience with the system and introduce new elements to their respective research programs.

The Ames simulator will support an extensive human factors research program, taking detailed looks at the human side of the people-machine relationship. For example, researchers would like to know if, after long hours in what is essentially a video cockpit, the pilot or copilot will experience more or less fatigue compared with a conventional cockpit.

The Langley simulator, which will study the total system, may change somewhat before a final work station design is selected. Different types of controllers, keyboards and flying tasks will be examined.

The idea of totally redesigning the transport work station is largely an outgrowth of another Langley research project that introduced electronic cathode ray tubes to the cockpit of a specially instrumented Boeing 737. The flight work has already proven that computer-driven electronic controls and displays can save time and fuel, especially during approach to terminal areas.

Langley's major research objectives for its simulator are to examine needs for transfer of information to and from the flight crew; study the use of advanced controls and displays for all-weather flying; explore ideas for using computers to help the crew in decision-making; and study visual scanning and reach behavior under different conditions with various flight deck arrangements.

"The potential capabilities of the system are exciting," says George G. Steinmetz, research project manager for Langley's advanced concepts simulator. "Take all-weather flying, for example. The pilot of the future may be enroute, with a nice preprogrammed route already stored in the computer, when a thunderstorm drifts across the flight path. We want it to be very convenient for the pilot to change the course of the airplane, skirt the thunderstorm and get back on schedule.

"As we envision it, one possibility is to have the pilot look at his map display (on one of the video screens), reach over and touch it in the right places and say, 'I want a new way point there, there and there,' and have the computer do most of the work. The computer would take care of finding the new course and computing the new bearings. It would even increase the speed of the airplane just the right amount to compensate for travelling the extra distance, so the pilot could stay on schedule."

In Steinmetz's example, the pilot used two new tools that will be studied in the Langley simulator: touch panels and voice recognition systems. Touch panels can be made a part of a video display, extending a pilot's control through vision. Voice systems may be used to extend a pilot's control through speech at times when hands are busy with other tasks. Experience in the simulator is needed to determine which method, or combination of methods, is better for certain tasks.

Experience is also needed to determine how to reduce the workload, yet keep the pilot involved and alert to avoid complacency.

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For Release:
November 14, 1983

RELEASE NO. 83-92

SPITZER HONORED BY ENGINEERING SOCIETY

HAMPTON, Va.—Cary R. Spitzer, an electronics engineer in the Systems Applications Office, Flight Control Systems Division, at NASA's Langley Research Center, has been selected to receive a Centennial Medal from the Institute of Electrical and Electronics Engineers, Inc. The presentation will be made in early 1984 in recognition of his exceptional service to the institute and to the profession.

In celebration of the IEEE Centennial Year in 1984, there will be 1,984 Centennial medals awarded worldwide to individuals who have made substantial contributions to electrical engineering. The award is not limited to members of the institute.

Two IEEE entities nominated Spitzer for the medal: the Aerospace and Electronic Systems Society and the Hampton Roads Section.

Spitzer is a senior member of the institute, a past president and life member of the IEEE Aerospace and Electronic Systems Society and has served on a number of IEEE national boards and committees.

Spitzer began his NASA career in October 1962 conducting research on thermal sensors for models being tested in various wind tunnels at Langley. Spitzer joined the Viking Project Office in February 1969 as manager of the molecular analysis

- more -

investigation. He served as manager of the physical properties and magnetic properties ivestigations on the Viking Lander, Deputy Director for Operations in the Science Analysis and Mission Planning Directorate of the Viking Flight Team, and Deputy Viking Project Manager for Langley Research Center Operations. He was editor of the book, "Viking Orbiter Views of Mars." In his present position, Spitzer examines the role of avionics (aviation electronics) in advanced aircraft and spacecraft concepts and defines the avionics research programs for the next decade.

A native of New Hope, Va., Spitzer received a bachelor of science degree in electrical engineering (communications option) from Virginia Polytechnic Institute and State University in 1958. He received a master of science degree in management engineering from George Washington University in 1970.

Spitzer, his wife and son, lives in Williamsburg, Va.

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National Aeronautics and
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Hampton, Virginia 23665
AC 804 865-2934

H. Keith Henry

Release No. 83-93

For Release:
November 16, 1983

NASA RESHAPES TURBOPROPS TO EXTEND FUEL SAVING

In an effort to improve the fuel efficiency of future aircraft, NASA propulsion researchers are taking the turboprop of the 1950s and 1960s and reshaping it for the 1980s and beyond.

The new turboprop — a cross between early propeller concepts and the turbofan engines of modern jet transports — is evolving from NASA's Aircraft Energy Efficiency program studies begun in response to the 1973 oil embargo and sharply rising fuel prices. These studies identified possible aeronautical propulsion technology having a combined potential for improving the fuel efficiency of future aircraft by 50 percent.

Numerous studies and subscale tests of advanced turboprop concepts verified the turboprop's potential to provide a fuel savings of 15 to 30 percent. The advanced turboprops were especially designed to absorb more power and to maintain efficiency up to conventional, subsonic turbofan cruise speeds. At intermediate flight ranges, fuel savings of 15 to 20 percent were identified. Fuel savings were even larger at the long and short flight ranges, reaching 25 to 30 percent for the short routes.

These test results make the advanced turboprop look particularly attractive for short/medium haul markets currently served by the DC-9 and the Boeing 727 and 737 aircraft which have capacities of 120 to 150 passengers. Extending propeller efficiency for flight at the higher speeds of modern jet transports is a major technological hurdle today.

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For example, an aerodynamic effect known as "compressibility" limits the speed at which conventional propellers can operate efficiently. Working with the propeller industry, researchers at Lewis Research Center in Cleveland have taken advantage of several technology advances in propeller blade structure and aerodynamics to dramatically reshape the propeller and thereby delay the onset of compressibility effects.

The researchers' design for an advanced turboprop propulsion system consists of eight or 10 highly swept blades that are about one half as thick as conventional propeller blades on a single engine shaft. Reducing blade thickness and providing blade sweep at the tips delays the onset of compressibility effects and the attendant drag rise and noise-producing supersonic shock waves. The increased number of these highly "loaded" blades helps keep propeller diameter to a reasonable size and weight. New materials and construction techniques allow the blades to be shaped for near optimum aerodynamic efficiency for flight over the entire speed and altitude range of modern jet transports.

Other technological challenges for the turboprop include reducing engine noise and vibration for passenger comfort, finding the most aerodynamically efficient mating of the engines to the airframe and reducing propeller and engine gearbox maintenance. The newly-shaped, thin, highly swept turboprop blades may lower the noise and vibration levels enough to reduce acoustic treatment weight in the aircraft cabin walls.

In conventional aircraft, the weight of noise absorption materials can be as high as 3,630 to 4,540 kilograms (8,000 to 10,000 pounds) for a medium sized, medium range transport. If propeller noise could be reduced by 10 decibels and improved acoustic treatment could be used, the weight penalty could be as low as 680 kg (1,500 lb.). Reducing aircraft weight also reduces fuel consumption.

The efficient mating of propeller engine and airframe is being accomplished primarily through installation aerodynamic analysis and wind tunnel tests at NASA's

Ames and Langley Research Centers. Considerable effort is devoted to straightening the swirling air streaming from the propeller to achieve maximum propeller thrust and reduce air drag. If unchecked, the interference drag could seriously compromise the fuel savings of the turboprop with its large, exposed propeller system.

NASA plans to award a contract next year to an American airframe manufacturer for research leading to high speed flight tests of a large-scale advanced turboprop. Scheduled for early 1987, the tests will involve mounting a single advanced turboprop on the wing of an existing transport. The flight tests, designed to prove the system's fuel economy and reliability, will offer the first comprehensive large-scale tests of advanced turboprop structural integrity, propeller near- and far-field noise, and cabin noise and vibration.

Meanwhile, NASA continues to work on improved propeller designs, including contra-rotating propellers, cabin noise reduction, installation aerodynamics and alternative configurations, including aft-mounted and pusher propeller arrangements.

Researchers at NASA's three aeronautical centers are working with the U.S. aviation industry in these efforts. The NASA propulsion team has been led by NASA's Lewis Research Center in Cleveland, aided by Langley Research Center, Hampton, Va., and Ames Research Center, Mountain View, Calif.

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For Release:
December 8, 1983

RELEASE NO. 83-95

LANE TO DISCUSS CANCER RESEARCH AT NASA LANGLEY COLLOQUIUM

Hampton, Va. — In a molecule of DNA in each human cell, there are 100,000 genes, each carrying instructions to produce a single body protein. Inside each gene, 6,000 nucleotides in coded sequence contain the information for the opertion of that particular gene.

Researchers have recently been able to discover the details of some minute changes in the genetic code which convert a normal cell to a cancer cell.

Dr. Mary-Ann Lane of the Dana-Farber Cancer Institute, Boston, Mass., will review these recent advances in the understanding of cancer at the Langley colloquium Monday, December 12, in the Activities Center, Building 1222. The lecture, "Current Issues in Cancer Research," will begin at 2 p.m., preceded by a press briefing at 1:15 p.m.

According to Dr. Lane, the changes which cause a cell to become malignant form a multi-stage process. In several types of cancer, genetic events have been identified which occur at an early stage to produce a rapidly dividing population of cells which is still subject to limitations of its growths through biochemical regulatory signals. In a later event, a second gene becomes activated through changes at the DNA level. Cells in which both events have occurred are no longer subject to regulatory signals and behave in a malignant manner. Understanding the function of these genes in both normal and abnormal cells will lead to methods of preventing cancer.

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Lane is Chief of the Laboratory of Molecular Immunobiology at the Dana-Farber Cancer Institute, a branch of the Harvard Medical School. She has studied at Boston University, Georgia State College, the National Institute of Health, Johns Hopkins University and the Cornell University. She has given numerous lectures to medical societies and university research associations both in the United States and aboard, and is the author of many technical papers on cancer research.

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NASA News

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For Release:

December 15, 1983

RELEASE NO. 83-96

SAM II INSTRUMENT PROVIDING ENVIRONMENTAL INFORMATION

SAM II, a NASA satellite instrument, has been methodically measuring Earth's atmosphere for five years, providing scientists with large amounts of information about the stratosphere, particularly in the polar regions. Some of the data have helped verify existing scientific theories, but other information has been quite surprisin[g].

"Among many achievements, SAM II has provided excellent data on volcanic activity," according to Dr. M. Patrick McCormick, SAM II science team leader at NASA's Langley Research Center in Hampton, Va. "The data clearly show the buildup of aerosols in the stratosphere's polar regions and, therefore, provides scientists with the necessary data to study the climatic effects of recent volcanic eruptions."

Increased volcanic activity, as from the 1982 eruption of El Chichon in southern Mexico that put huge amounts of sulfur dioxide into the stratosphere, is in direct opposition to the "greenhouse effect" in the atmosphere. That effect is caused when large amounts of carbon dioxide, concentrated in the lower atmosphere, tend to prevent Earth's heat from dissipating into space.

Global volcanic clouds, however, laced with sulfuric acid (created when sulfur dioxide condenses), reflect the Sun's radiation back into space, thereby depriving the lower atmosphere and Earth's surface of some radiation and tending to cool the surface.

- more -

One could almost argue that more volcanic accumulation in the stratosphere will help to balance Earth's radiation budget by counteracting the carbon dioxide effect: icehouse versus greenhouse.

The most surprising SAM II finding to date also represents a rapid commercial spinoff of NASA research. In late 1982, airline people throughout the world began to notice that the acrylic windows in some of their larger aircraft were being mysteriously clouded over with minute cracks. They discovered that the damage, called crazing, occured on those planes that flew polar routes. Routine cruising altitudes of 30,000 to 35,000 feet become stratospheric in the polar regions, where the stratosphere dips closest to Earth's surface.

The airlines blamed the aircraft manufacturers, who blamed the window makers, who swore their innocence. During the growing tension and frustration, one aircraft company manager called NASA-Langley for possible help. Evidence from SAM II showed that volcanically produced sulfuric acid in the stratosphere was causing the window crazing. To help solve the problem, McCormick is now an adviser to a task force of air transport operators.

SAM II is also providing scientists with data on the length of time stratospheric volcanic debris from a point source takes to arrive at the polar regions. This information is important in understanding stratospheric transport and dispersion, and is obviously relevant to the global consequences of possible nuclear detonations.

SAM II data are providing better understanding of the dynamics of vortex activity in the polar regions. An aerosol data base provided by SAM II is used as a tracer for stratospheric motions, and an aerosol "ledge" can be clearly seen at the boundary of vortexes of cold polar air.

- more -

The Langley researchers are also pleased with SAM II's discovery of ice clouds in the polar stratosphere near 60,000 feet. "We named them," McCormick said with pride. "They are called PSC's, for Polar Stratospheric Clouds, and we published the first quantitative data on the phenomenon and on its formation mechanism."

Nacreous (pearl-hued) clouds have been sporadically sighted through the years in the winter months by observers on Earth. The clouds were thought to occur at around 70,000 feet under specific meteorological conditions. SAM II found that PSC's occur much more frequently than the scattered visual sightings reflect; during its first two years of operation, SAM II measured more than 1,000 PSC's. The researchers have concluded that the nacreous clouds are probably a sub-element of PSC's.

SAM II—full name Stratospheric Aerosol Measurement II instrument—was launched into polar orbit aboard the Nimbus 7 satellite October 24, 1978, from NASA's Western Test Range near Lompoc, Cal. Nine scientific instruments were aboard, all designed to study natural and man-made pollutants in Earth's atmosphere and oceans. The Nimbus program is managed at NASA's Goddard Space Flight Center, Greenbelt, Md.

Some of the Nimbus instruments have stopped operating, but SAM II has steadily sensed, collected and dispatched to Earth more than 50,000 profiles to date on aerosol concentration in the lower atmosphere.

Another SAM II accomplishment is the set of polar aerosol data that is being analyzed and archived by Langley researchers. The data set, the first of its kind, is used to study the spatial and temporal variations in aerosol concentration, its impact on weather and climate and their long-term trends.

The Langley SAM II team members, some of whom are now working on other atmospheric aerosol measurement projects, still find time to process, archive, manipulate, and check the quality of SAM II data—and then write technical papers on the results. More than 20 papers have been published to date.

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NASA News

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For Release:

Jean Saunders
(804) 865-3006

January 6, 1984

RELEASE NO. 84-1

NASA-LANGLEY FABRICATION DIVISION CHIEF RETIRES

Hampton, Va.--W. Morris Phillips, Chief of the Fabrication Division at NASA's Langley Research Center, retired January 3, after more than 35 years of government service.

Phillips has been a division chief since 1976. Previously he served as head, Electronics Fabrication Development Branch; supervisory technician; experimental electronic mechanic, lead foreman; electronic instrument maker; and an apprentice electronic instrument maker.

He graduated from the NACA Apprentice School in 1954 and taught in the apprentice school for three years.

Phillips has received several achievement awards, a NASA Exceptional Service Medal and a Langley Equal Employment Opportunity Award.

Phillips and his wife, Doris Mae, live in Newport News. They have two children.

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NASA News

National Aeronautics and
Space Administration

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For Release:
January 9, 1984

RELEASE NO. 84-2

ANGELL TO SPEAK AT NASA-LANGLEY COLLOQUIUM

Hampton, Va.--"Micromachined Smart Silicon Sensors" will be the topic of the January 16 Langley colloquium to be held in the Activities Center at 2 p.m.

James B. Angell, professor and associate chairman, electrical engineering department, Stanford University, says silicon micromachining combines the highly developed technology of integrated-circuit fabrication with chemical etching techniques to accurately shape silicon. Angell said in this way, it is possible to fabricate wafers full of elaborate silicon structures with microscopic precision, excellent reproducibility and the promise of very low unit cost.

According to Angell, single-crystal silicon has marvelous mechanical properties. "It is as strong as steel and is completely free of mechanical hysteresis," Angell explained. Furthermore, because it is piezoresistive, its strain-gauge factor is at least 20 times greater than that of the best wire strain gauges. Therefore, high-performance sensors which convert mechanical parameters such as force, pressure or acceleration into electrical signals can be batch fabricated using micromachining."

In his lecture, Angell will also explain how these sensors can provide very high accuracy with long-term performance at low cost.

Angell's research interests at the university are the application of integrated-circuit technolgoy to the fabrication of sensors for biomedical instrumentation, and the generation and manipulation of musical sounds with digital systems.

Following the lecture, Angell will be available for an informal discussion in the Langley Room. Preceding the lecture a press briefing will be held at 1:15 p.m.

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X

H. Keith Henry

Release No. 84-3

For Release:

January 12, 1984

NASA RESEARCH FINDS AIRCRAFT SURFACE GROOVES MAY TAME TURBULENCE

Barely visible grooves, on the surface of an airplane, may help to tame drag-producing air turbulence and increase fuel efficiency, NASA research has shown.

The grooves, shaped like tiny "v's" with the angle pointing forward on the fuselage, might be no more than two-thousandths of an inch deep. But they would be deep enough, NASA thinks, to favorably alter the turbulent flow of air that forms over the surface of a moving airplane.

On today's airplane surfaces, most of the air flow is turbulent. Within this flow are violent eruptions called bursts that begin at the surface which are responsible for most of what aerodynamicists call "skin friction drag" and nearly half the total aerodynamic drag on an airplane. If the intensity of these bursts can be reduced, the reduction in drag would translate directly into lower fuel consumption or an increase in aircraft speed.

Reducing skin friction drag has been targeted by NASA's Langley Research Center, Hampton, Va., as a research goal of the 1980's, with a major focus on understanding and control of turbulent bursts.

Experiments at Langley have shown that small "v" grooves with equal height and spacing can reduce net turbulent skin friction drag up to 10 percent, compared with

- more -

ungrooved smooth surfaces. The grooves, also called "riblets," were machined into flat aluminum samples and tested in wind tunnels.

A turbulent drag reduction of 10 percent would translate to a fuel savings of about 2 1/2 percent, a potentially hefty $200-300 million annual savings for the U.S. commercial airline fleet, estimates Jerry N. Hefner, a researcher in Langley's High-Speed Aerodynamics Division. The division's long-range goal, he says, is to double the demonstrated drag reduction to 20 percent, providing a five percent savings in fuel.

"When we change a flat smooth surface into small riblets of the size we're studying," says Hefner, "we're really talking about v-shaped valleys the size of scratches. Although these precise little grooves are small, they obviously have a pronounced effect on the turbulence and skin friction drag."

Confidence is rising that these relatively small-scale results can be repeated under flight conditions on a full-sized air transport. If the concept continues to prove itself in ground tests, the first flight test could come in 18 to 24 months.

An item published in NASA's "Tech Briefs," a magazine devoted to transfer of technology to U.S. industry, prompted the 3M Co. of St. Paul, Minn., to design and produce test specimens of riblets in tape form. The company determined it would be simpler to take a lightweight extruded film with adhesive backing and press it into place, rather than groove the metal skin.

In Langley tests, these grooved plastic films are reducing turbulent drag as well as, or better than, machined aluminum surfaces with the same groove sizes and shapes, reports Michael J. Walsh, principal researcher in Langley's riblet work.

Some surface areas may not benefit from riblets. Where the flow of air over the airplane is not turbulent, a smooth ungrooved surface would be best; in highly complicated flows over wing and tail surfaces, further research is needed to determine if riblets will significantly reduce skin friction drag. Even with these exceptions, a majority of the fuselage — representing about half the area of the aircraft — remains a good candidate for riblets.

Repair of damaged riblet surfaces is not expected to be a problem on an airplane with plastic film. The old sheet would simply be pulled off and a new sheet, cut to fit, would be applied in its place. In much the same way, plastic or some similarly grooved film could be applied to existing aircraft as a relatively economical retrofit measure.

Recent observations indicate that projections on the skin of fast-swimming sharks resemble riblets. Called dermal denticles, the projections are made of the same material as shark's teeth and typically have four or five very small grooves on what looks, to the unaided eye, like tiny flat surfaces. Slower sharks also have grooved projections, but the grooves do not line up to create the effect of continous v-grooves.

Research at Langley identified the riblet concept and its precise v shape before this clue from nature was found. The concept was derived by NASA from research indicating favorable flow characteristics of water through triangular pipes. The idea of adding sharks data came from an effort in the Soviet Union to uncover secrets from the animal world to aid in the more efficient propulsion of airplanes, ships and submarines.

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(NOTE: NASA-LANGLEY PHOTOGRAPHS L-83-9,168 and L-83-9,167 ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY WRITING OR TELEPHONING KEITH HENRY AT AC 804-865-2934/2932.)

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H. Keith Henry

Release No. 84-4

For Release:

May 31, 1984

NASA WORKS TO IMPROVE AERIAL APPLICATION OF CHEMICALS

NASA research may contribute to more efficient methods for aerial application of insecticides and herbicides.

The agency has conducted basic research in aerodynamics relating to aerial applications since 1976, when chemical drift from target areas was identified as the aerial application industry's most important technical concern because of increasing chemical costs and environmental factors.

Control of chemical drift is a complex problem requiring an understanding of many factors, including airplane wake aerodynamics. Researchers at NASA's Langley Research Center, Hampton, Va., have worked to improve the integration of airplane wake characteristics with dispersal equipment to produce wider, more uniform application patterns for liquid or solid agricultural chemicals released in the wakes of airplanes or helicopters with minimum losses due to chemical drift.

To accomplish this, a computer program or code was developed, tested and made available to interested U.S. agricultural aircraft or equipment designers and operators. The code, dubbed AGDISP (for AGricultural DISPersal), accounts for the effects of atmospheric turbulence, crosswind, propeller slipstream, terrain variations, droplet evaporation and plant canopy density on particle trajectories. Development of AGDISP was jointly funded by the USDA Forest Service and NASA. It is the first spray prediction technique that incorporates both atmospheric and aircraft aerodynamic properties and,

- more -

therefore, offers greatly improved accuracy.

Despite its complexity, the code is quick and easy to use by operators without a background in aerodynamics. Only information readily available to the aircraft operator is needed, such as engine RPM and propeller diameter. One computer software company is making the code available in a "language" compatible with many home computers.

Initial investigations involved ground testing a scale model agricultural airplane in Langley's Wake Vortex Facility and a full-scale airplane in the center's 30 by 60 Foot Wind Tunnel. "These tests," explains Dana Morris, an engineer in Langley's Low-Speed Aerodynamics Division, "showed us we could alter the airplane wake and measure the impact of the spray deposition pattern."

Then experimental flights were conducted at NASA's Wallops Flight Facility, Wallops Island, Va. In the tests, an Ayres Thrush S2R-800 agricultural airplane (loaned without charge by the Ayres Corporation, Albany, Ga.) was flown low over three long rows of adhesive strips, 50 feet apart, and solid particles were released to simulate spray droplets. The tests provided wake interaction data showing the influences of atmospheric and airplane operating conditions on spray patterns. These data were then correlated with computer predictions.

Comparison of AGDISP computer predictions with experimental data from the flight tests shows generally good agreement, prompting Dr. Bruce J. Holmes, Langley's aerial applications program manager, to conclude that preliminary analysis of aircraft configurations and dispersal systems can now be made without costly flight tests for each aircraft and nozzle system.

The experimental work provides examples of using the computer code for two different types of analysis, explains Morris: "First, the code will be applied to the problem of predicting ground deposit pattern changes, either due to dispersal system changes or to aerodynamic modification to the airplane. Second, the code will be applied

- more -

to the problem of evaluating the influence of aircraft operating procedures such as airspeed or altitude on ground deposit patterns."

One aerodynamic modification of the airplane during flight test was the addition of winglets, relatively small vertical wing surfaces at the wing tips. AGDISP correctly predicted that the modification would improve spray results. The swirling vortex of air that normally comes off the wing tip was displaced to near the tip of the winglet. Without winglets, the vortex was lower, closer to the spray nozzles and tended to entrain more particles around the vortex, contributing to the drift problem.

The code will help an operator determine whether or not to spray under existing wind conditions and the best operational flight conditions for a given set of atmospheric conditions.

The flight tests discovered that maintaining the target altitude is critical for achieving the predicted ground distribution, but that airspeed variations have relatively little effect.

The U.S. Air Force and Lockheed-Georgia Corp. are working with Langley to apply knowledge from AGDISP to the design of a new dispersal system to be mounted on Lockheed C-130 aircraft to spray mosquitoes. The State Department is using information gained from a spray system designed and tested by Langley, at the department's request, for high-speed, high-altitude spraying of illicit drugs. Future users may even include ultralight aircraft companies considering a move into aerial applications.

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AC 804 865-2934

For Release:

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February 15, 1984

RELEASE NO. 84-8

MATHCOUNTS COMPETITION SET FOR FEBRUARY 25 AT NASA-LANGLEY

The NASA-Langley Research Center will host the regional competition of the first annual National MATHCOUNTS Program February 25 in the Langley Activities Center, Building 1222.

The Peninsula Chapter of the Virginia Society of Professional Engineers will administer the competition beginning at 8 a.m.

The MATHCOUNTS Program, designed to improve mathematics achievement levels among seventh and eighth grade students, is sponsored by the National Society of Professional Engineers, the National Council of Teachers of Mathematics, the CNA Insurance Companies, the National Science Foundation and NASA.

The program involves a series of competitions beginning at the regional level in February, during National Engineers Week, and proceeding to the state level at Langley in April and the national level in Washington, D.C. in May.

The regional competition will involve teams from 12 area middle and junior high schools—three from York County, three from Hampton and six from Newport News.

NOTE TO EDITORS: Dr. Mary Lewis, Educational Programs Secialist at the Langley Research Center, and Robert C. Dolecki, Chairman, MATHCOUNTS Committee, will be available for interviews during the February 25 competition.

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For Release:
February 27, 1984

RELEASE NO. 84-9

JACKSON SELECTED AS ASSISTANT CHIEF OF NASA-LANGLEY DIVISION

Charlie M. Jackson Jr. has been designated Assistant Chief for Special Programs, High-Speed Aerodynamics Division, at NASA's Langley Research Center.

In this position, Jackson is primarily responsible for managing special military-related research programs and coordinating these activities with the Department of Defense and the aerospace industry. In addition he provides assistance to the division chief in other areas of research, management and administration.

In October 1955, Jackson began his career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, as an engineering co-op in the Fabrication Division. Since then, he has specialized in aerodynamic performance, stability and control, fluid and flight mechanics, as well as propulsion integration. He has also been head of the Propulsion Aerodynamics Branch and the Supersonic Aerodynamics Branch.

He graduated with honors from the Virginia Polytechnic Institute in 1959 where he earned a bachelor of science degree in aeronautical engineering. The author or co-author of 36 technical publications, Jackson has two patents, is a registered professional engineer of Virginia and is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

He and his wife, Mary, live in Yorktown, Va. and have two children.

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For Release:
February 28, 1984

RELEASE NO. 84-10

POLHAMUS AWARDED WRIGHT BROTHERS LECTURESHIP IN AERONAUTICS

The name of a Distinguished Research Associate at the NASA Langley Research Center in Hampton, Va. has been added to an impressive list of U.S. and European aeronautical experts.

Edward Polhamus, head of Langley's Fluid Dynamics Branch at the time of his retirement in 1981, recently received the prestigious AIAA Wright Brothers Lectureship in Aeronautics. The award was accompanied by the Wright Brothers Medal. The list of past recipients includes, among others, Hugh L. Dryden, Glenn L. Martin, Theodore Von Karman, and Sydney Goldstein.

This honor has been awarded each year since 1937 to "commemorate the first powered flights made by Orville and Wilbur Wright at Kitty Hawk in 1903, and intended to emphasize significant advances in aeronautics by recognizing major leaders and contributors thereto." Because of his broad range of leadership in aerodynamic advances and his many personal contributions to the field of aerodynamics, Polhamus was nominated and chosen for the honor.

Polhamus is the second person to receive the award while working at the Langley Research Center. The first was when the late John Stack, who became an Assistant Director of the Center, was honored in 1944.

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With an amused smile Polhamus said, "Coincidentally this was the same year that I joined Langley." He continued modestly, "The award was a tremendous surprise to me and much of the credit should go to my collegues who helped and encouraged me through the years."

Polhamus presented his lecture, "Applying Slender Wing Benefits to Military Aircraft" and received the medal during the AIAA/AHS Aircraft Design, Systems and Technology Meeting in Fort Worth, Texas. In the lecture he reviewed some of the past and current research at Langley related to the application of slender wing aerodynamic benefits to high-speed tactical and strategic military aircraft.

He received further recognition for the Wright Brothers Lectureship early this year when Langley presented him with a plaque containing details of the AIAA award. Robert Bower, Director for Aeronautics at the center said, "The plaque was given as an applause to Polhamus for receiving the award. It was also a token of appreciation for his long distinguished career at Langley."

A native of Washington, D.C., Polhamus attended the University of Maryland where he earned a bachelor of science degree in mechanical engineering. Following his graduation in 1944, he joined the Langley staff as an aeronautical engineer.

During his career Polhamus has been active in aerodynamics research related to the development of high speed aircraft, advanced research facilities and aerodynamic techniques in general. He is also the author of over 60 technical papers.

In the late 1950's and early 1960's he was one of the primary leaders in Langley's extensive variable-sweep aircraft research program which led to a practical application of the concept and provided a broad design data base. He is the holder or co-holder of three U.S. patents on variable sweep wings. In 1963 he received a NASA award as co-inventor of the variable-sweep aircraft configuration concept which led to the U.S. Air Force F-111 and B-1, and the Navy F-14 aircraft.

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In addition to his research leadership, he served as an adviser to the Defense Department and the Air Force on variable-sweep technology. He is also one of a group of six U.S. aerospace technologists recognized in the National Air and Space Museums Flight Technology Gallery for their outstanding technical contributions in various fields during the 1960's.

In the latter part of the 1960's he developed the leading-edge suction analogy which bears his name. This analogy provides a simple solution to the difficult problem of predicting the large lift generated by the vortices shed from the leading edge of high swept wings. Important in highly swept wing design, his analogy is recognized internationally as being very accurate and the most versatile method available. This and other vortex flow research, by members of his branch, was responsible for application of the Vortex-Lift Concept to provide the high maneuver capability of the F-16 lightweight fighter.

One of his most notable contributions was his leadership and vigorous advocacy during the development of the cryogenic wind tunnel concept. The tunnel was needed as a means for achieving high Reynolds number transonic testing capability with lower model loads, capital and operating costs than any other practical wind tunnel concept. In the early 1970's, members of his branch conceived and developed a practical concept for a tunnel capable of operating at cryogenic temperatures, and demonstrated its validity and unique capabilities in two small wind tunnels. This pioneering work led to the selection of the cryogenic concept for the recently dedicated National Transonic Facility at Langley. This wind tunnel will allow the United States to maintain its leadership in high-performance commercial and military aircraft.

In 1974 he was awarded the NASA Medal for Exceptional Scientific Achievement which bears the citation, "for outstanding leadership and personal contributions in developing aerodynamic technology that has significantly improved U.S. fighter aircraft and for leadership in developing advanced aerodynamic testing techniques and technology."

From 1977 until 1981, Polhamus represented NASA on the Fluid Dynamics Panel of NATO's Advisory Group for Aerospace Research and Development. In this assignment he was active in high-angle-of-attack aerodynamics and served as the U.S. focal point for the exchange of cryogenic wind tunnel testing technology.

Polhamus has indeed been a major leader and contributor to the field of aerodynamics and is one of the many gifted men at Langley.

He and his wife, Jo, live in Newport News, Va. and have two sons.

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For Release:

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March 6, 1984

RELEASE NO. 84-12

QUEENS LAKE WINS REGIONAL MATHCOUNTS COMPETITION

Queens Lake Intermediate School in York County won first place in the MATHCOUNTS regional competition held at Langley February 25.

Second place award went to Dozier Middle School of Newport News, third place went to Tabb Intermediate School in York County and fourth to Hines Middle School in Newport News.

Laura Lising of Spratley Junior High School in Hampton won the individual award for earning the highest individual score.

The day-long competition consisted of five distinct segments, each with its own procedures, rules and requirements. Four written sections were administerd in the morning. The ten individuals with the highest scores participated in an oral segment, rated by a panel of three judges, during the afternoon. These individual scores were added to the team scores to reach a final score.

Langley assisted the Peninsula Chapter of the Virginia Society of Professional Engineers with the regional competition. Also sponsoring the program, which is designed to improve mathematics achievement levels among seventh and eighth grade students, are the National Society of Professional Engineers, the National Council of Teachers of Mathematics, the CNA Insurance Companies, the National Science Foundation and NASA.

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Langley will honor the four teams at a luncheon in the cafeteria March 14. Dr. Robert Tolson, Langley's Chief Scientist, will present certificates of achievement to each individual.

On April 7, these four teams will participate in the state competition and then the top winners will go on to compete at the national level in May.

Receiving trophies for placing in the regional competition were Chris Boynyon, David Defashy, Michael Fripp and Brian West, Queens Lake Intermediate School; Yujin Asai, Billy Glidden, Banon Jackson and Michelle Spinka, Dozier Middle School; Nathan Brierly, Karen Hawk, Andrew Luh and Robbie Thompson, Tabb Intermediate School; and Brian Bevins, Jordan Grant, Marty Conn and Kathy Taylor, Hines Middle School.

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March 6, 1984

RELEASE NO. 84-13

LEVINE TO SPEAK AT NASA-LANGLEY COLLOQUIUM

"The Earth's Early Atmosphere: A New View" will be the topic discussed at a NASA-Langley Research Center colloquium Monday, March 12.

Dr. Joel S. Levine, senior research scientist in the Atmospheric Sciences Division, will speak in the Activities Center at 2 p.m., preceded by a press briefing at 1:15 p.m.

According to Levine, the composition of the atmosphere changed significantly, over geological time, as a result of volcanic emissions, the gravitational escape of light gases, the formation of the oceans and sedimentary carbonate rocks, changes in the radiation emitted by the Sun, various atmospheric photochemical and chemical processes and the emergence of life.

Recent studies have suggested a new picture for the composition of the early atmosphere and its evolution over geological time. The early atmosphere is now believed to have been composed of nitrogen, carbon dioxide and water vapor rather than ammonia, methane and molecular hydrogen. Other new ideas concern the synthesis of complex organic molecules (the precursors of life) in an early mixture of nitrogen, carbon dioxide and water vapor; the buildup of oxygen and ozone in the early atmosphere; and the timetable for the shielding (by atmospheric ozone) of the Earth's surface from biologically-lethal solar ultra-violet radiation.

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Levine said the chemical evolution of the atmosphere is continuing at the present time, primarily as a result of the input of gases from anthropogenic activities that include the burning of fossil fuels, high temperature combustion and various industrial and agricultural activities. Measurements indicate that atmospheric levels of carbon dioxide, methane, nitrous oxide and chlorofluoromethanes are increasing, Levine explained All these gases impact the Earth's climate via the greenhouse effect. Anthropogenic gases may also affect levels of ozone in the stratosphere and lead to the formation of acid precipitation.

Levine joined Langley in 1970, after six years at the Goddard Institute of Space Studies in New York City. His present research activities include theoretical photochemical modeling of the atmosphere with particular emphasis on the early atmosphere and the present troposphere, atmospheric chemistry initiated by lightning and the production of atmospheric gases by biogenic activities.

He received a bachelor of science degree in physics from Brooklyn College of the City University of New York, a master of science degree in meteorology from New York University, and a master of science degree in aeronomy and planetary atmospheres and a doctorate in atmospheric sciences from the University of Michigan.

In 1982, Levine became the youngest person and the first U.S. government employee to receive the Halpern Award from the New York Academy of Sciences. He also received the NASA Medal for Exceptional Scientific Achievement in 1983 for his research work.

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For Release:
March 20, 1984

RELEASE NO. 84-16

NASA-LANGLEY RECEIVES EQUAL OPPORTUNITY TROPHY

NASA's Langley Research Center has received the NASA Equal Opportunity Trophy for FY 1983. The trophy is awarded annually to the installation with managerial strategies which produced the most positive affirmative action/equal opportunity results. This year, Langley shares the award with NASA Headquarters in Washington, D.C.

The trophy, which will stay at Langley for six months and at NASA Headquarters for six months, was presented to Langley by Dr. Harriett Jenkins, Assistant Administrator, Office of Equal Opportunity Programs, NASA Headquarters. Dr. Donald P. Hearth, Langley Director, accepted the trophy during a special ceremony at Langley March 13.

The citation accompanying the award read, "In recognition of well planned and executed management strategies which have contributed to the employment, development and utilization of minorities, women and the handicapped at NASA, and which have shared the agency's resources with a broader array of American citizenry."

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Langley is being recognized for the following accomplishments: the first time a NASA center has met or exceeded all of the agency affirmative action guidelines; increasing the minority and women workforce representations 12 and 14 percent respectively; increasing the minority/women GS-14 and supervisory representations 39 and 35 percent respectively; increasing grants awarded to minority colleges from $.6 million to $2.5 million; informally resolving all potential discrimination complaints since July 1981; initiating a day care center; and involving the senior staff in implementing the affirmative action/equal opportunity programs.

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For Release:

March 27, 1984

RELEASE NO. 84-18

YOUNG RECEIVES 1984 AIAA GROUND TESTING AWARD

James C. Young, an aerospace engineer in the Space Systems Division, has received the 1984 Ground Testing Award presented by the American Institute of Aeronautics and Astronautics. The award is presented annually "for outstanding achievement in the development or effective utilization of technology, procedures, facilities, or modeling techniques for flight simulation, space simulation, propulsion testing, aerodynamic testing, or other ground testing associated with aeronautics and astronautics."

The award, presented to Young March 6 at the 13th Aerodynamic Testing Conference in San Diego, included a medal, certificate of citation and rosette pin. The accompanying citation reads, "in recognition of singularly outstanding contributions to the wind tunnel testing and aerodynamic design of the Space Shuttle. His technical and managerial contributions have been vital to the Shuttle's success from concept through flight."

Young's outstanding contributions toward the aerodynamic design, development and testing of the Space Shuttle were made while he was Manager of the Shuttle Aerodynamics Subsystem Program at the Johnson Space Center, where he worked from May 1967 until he transferred to Langley in July 1983.

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Young began his NASA career in February 1963 at the Marshall Space Flight Center. He has specialized in applied aerodynamics, project management and supervision and has served as lead engineer on aerodynamic configuration design studies and as a consultant to Space Shuttle ascent and entry aerodynamics subsystems managers. At Langley, his work includes performing analysis of Shuttle flight test data.

Before joining NASA, Young worked for Chrysler Corporation, Huntsville; McDonnell Aircraft, St. Louis; and Convair, Ft. Worth.

A native of Texas, Young graduated from Frost High School and received a bachelor of science degree in aeronautical engineering from the University of Texas in 1956. He has done graduate work at the University of Alabama.

The author or co-author of five technical publications, Young has received many awards for his research work and contributions to the Space Shuttle Program.

Young and his wife, Deborah, live in Gloucester. They have two sons.

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For Release:
March 27, 1984

RELEASE NO. 84-19

NASA LANGLEY INVENTORS HONORED AT LUNCHEON

Thirty-eight Langley inventors who received United States patents in 1983 and recipients of Langley's Technology Transfer awards, were honored at the annual Inventors' Luncheon Thursday, March 29, at the Langley Officers' Club.

Dr. Donald P. Hearth, Langley Director, presented the awards. Dr. Joseph S. Heyman, NASA's Inventor of the Year for 1982, was the guest speaker. Heyman is Head, Materials Characterization Instrumentation Section, Instrument Research Center, at Langley.

Inventors receiving awards were Ashby G. Lawson, for a modified spiral wound retaining ring; Robert V. Doggett Jr. and Rodney H. Ricketts (two awards each), for aeroelastic instability stoppers for wind tunnel models; Richard R. Adams, Ian O. MacConochie and Bordie D. Poole Jr., for a miniature spectrally selective dosimeter; Paul M. Hergenrother, for polyphenylquinoxalines containing pendant phenylethynyl and ethynyl groups; Dr. Ja H. Lee and Frank Hohl (posthumously), for a solar driven liquid metal MHD power generator;

James I. Clemmons Jr., for an instrument for determining coincidence and elapse time between independent sources of random sequential events; Dr. Ronald K. Clark and W. Barry Lisagor, for a fixture for environmental exposure of structural materials vibration isolation and pressure compression apparatus for sensitive instrumentation; Charles S. Gilliland and Roy J. Duckett, for a variable anodic thermal control coating;

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Dr. Lucio Maestrello, for an apparatus and method for jet noise suppression; Laurence J. Bement, for explosively activated egress area; Robert R. McWithey, Dick M. Royster and Thomas T. Bales, for a metal matrix composite structural panel construction; Kevin W. Noonan, an Army employee, for a family of airfoil shapes for rotating blades; Dr. Jack D. Leatherwood, Thomas K. Dempsey (posthumously), Sherman A. Clevenson and David J. Stephens, for a ride quality meter;

Dr. Jag J. Singh and Dr. George M. Wood Jr., for a low energy electron magnetometer using a monoenergetic electron beam; William H. Phillips, retired, for a solar powered aircraft; David C. Grana, retired, and Spencer V. Inge Jr., for a vertical shaft windmill; Robert M. Baucom, for a medical clip; H. Douglas Garner, for a magnetic heading; and Donald J. Progar, for a hot melt recharge system; and

Dr. John H. Cantrell Jr. and Dr. Joseph S. Heyman, for frequently tracked gated pulse technique for ultrasonic frequency. Heyman will receive another award with Dr. John R. Davidson, for error correction method and apparatus for electronic timepieces.

Dr. Terry L. St. Clair will receive three awards, one he shares with his wife, Anne K. St. Clair, for elastomer toughened polyimide adhesives; the others for thermoset-thermoplastic aromatic polyimide containing N-propargyl groups and for solvent resistant, thermoplastic aeromatic poly(imidesulfone) and process for preparing same.

Technology Transfer awards were presented to Dr. Terry L. St. Clair and to the Instrument Research Division. The citation accompanying St. Clair's award reads, "for outstanding effort and achievements in the transfer of NASA technology through the successful application of research in polymer chemistry to industrial, civil and military sector requirements and objectives."

The division's award, to be accepted by David R. Johnson and Marvin F. Burgess, will be given for "sustained superior performance in broadening and accelerating the transfer of NASA technology resulting in increased benefits to the industrial, medical, civil, and private sectors thereby reflecting great credit to NASA."

- end -

NASA News

National Aeronautics and
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For Release:
March 27, 1984

RELEASE NO. 84-20

MAGNETIC FLUIDS, TOPIC OF APRIL NASA-LANGLEY COLLOQUIUM

Magnetic fluid, or ferrofluid, becomes magnetized in the presence of an external magnetic field, but it also acts as a fluid, capable of assuming the shape of its container and of flowing downhill or around obstacles, according to Dr. Ronald E. Rosensweig, Senior Research Associate for Exxon Research and Engineering Company. The interaction of the magnetic and the fluid properties give rise to quite unusual phenomena.

Rosensweig, who has researched and directed fluid mechanical studies in energy related problems since 1973 at the Corporate Research Laboratories in New Jersey, will discuss "Magnetic Fluids: Phenomena, Analysis and Applications" at a Langley Research Center colloquium Monday, April 9. His lecture will be held in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15 p.m.

Rosensweig's color slide presentation will provide an overview of the phenomena and of ferrohydrodynamics, the theoretical description accounting for the behavior. A number of applications including lesser known uses will be introduced in illustration of the principles.

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A native of Hamilton, Ohio, Rosensweig earned a bachelor of science degree from the University of Cincinnati, and master and doctor of science degrees in chemical engineering from the Massachusetts Institute of Technology. At MIT, Rosensweig originated the scattered light technique for detection of turbulent mixing and also contributed to the statistical theory of turbulence.

Following a faculty appointment at MIT and serving as a consultant to industry in problems of heat transfer and reentry ablation, Rosensweig joined Avco Corporation in 1962. There he led an effort in the pioneering of magnetic fluid technology that resulted in the spin-off in 1968 of Ferrofluidics Corporation. He served as the firm's founding President and Technical Director, and Board Chairman until 1973.

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For Release:
April 17, 1984

RELEASE NO. 84-24

DAVENPORT NAMED CHIEF OF FABRICATION DIVISION AT NASA-LANGLEY

Joseph B. Davenport has been selected to head the Fabrication Division at NASA's Langley Research Center.

In this position, Davenport is responsible for planning, developing, directing, programming and evaluating technical services to build research test models and associated systems and equipment in support of Langley projects and programs requirements; administering contracted services, including metal, wood, composite, electronics and fabrication support contracts; and for the continuing development of processes, procedures and programs for improving fabrication methods and practices, including effective and efficient use of numerical-controlled machining systems and computer-aided fabrication equipment.

Davenport began his NASA career in November 1961 as an apprentice machinist. Since graduating from the Langley Apprentice School in 1965, he has been an experimental machinist, engineering technician, a supervisory engineering technician, a supervisory production controller and Assistant Chief of the Fabrication Division. He has specialized in aeronautical research model fabrication, cryogenic model fabrication techniques and fabrication contract management.

Before joining Langley, Davenport designed interior displays for a private museum in Lenox, Mass.

Davenport has received five Langley Suggestion Awards and numerous Group Achievement Awards. He was the fabrication session chairman for the Industry-wide Cryogenic Models Workshop held at Langley in 1982.

Davenport and his wife, Ann, live in Hampton. They have two sons.

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NASA News

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For Release:
April 26, 1984

RELEASE NO. 84-27

COLES TO DISCUSS "EDUCATION—THE ROLE OF FAMILY AND COMMUNITY" AT PUBLIC LECTURE

How young people—from early childhood to adolescence—acquire their values and ideas at home, play and at school, will be discussed at the "Our Future in the Cosmos" Public Lecture Series at the Hampton Coliseum Monday, May 7, at 8 p.m.

Dr. Robert Coles, Harvard University social psychiatrist and Pulitzer Prize winning author, will address "Education - The Role of Family and Community." According to Coles, children and adolescents possess surprising emotional and intellectual resources that promote learning skills and enable them to cope with external pressures such as racial and social inequality, economic deprivation and parental neglect or over expectation. In his lecture, Coles will suggest ways to encourage a strong sense of social responsibility and moral character in today's and tomorrow's children.

Coles has lived with and studied children and families from almost every economic and social group comprising the spectrum of American life: sharecroppers, migrant workers, mountaineers, blue collar workers, whites, blacks, Mexican-Americans, middle and upper classes, in urban and rural environments. In over 20 books and 300 articles, including the acclaimed "Children of Crisis" series, Coles has observed the strength and resiliency of the American family.

- more -

The Public Lecture Series is sponsored by NASA and the College of William and Mary. Free tickets for the lecture are available at the Coliseum Box Office.

NOTE TO EDITORS: Coles will give the same lecture at a Langley colloquium Tuesday, May 8, in the Activities Center, Building 1222, at 10 a.m., preceded by a press briefing at 9:15.

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For Release:

April 26, 1984

RELEASE NO. 84-28

SMALL BUSINESS IS OUR BUSINESS AT NASA LANGLEY

President Reagan has proclaimed the week of May 6-12 as Small Business Week to honor the small business owners of our nation.

It is NASA policy to place a fair proportion of its total purchases and contracts for supplies, research and development, and services with small business concerns. Each year, NASA Headquarters in Washington, D.C., sets socioeconomic program goals for contract awards at each NASA center. For FY 1984, the Langley Research Center's goals for contract awards to small businesses, minority/disadvantaged firms and women-owned firms are $55.3 million, $9 million and $3 million, respectively. In FYs 1982 and 1983, Langley was number one in the agency for the highest percentage of business dollar awards made to small businesses.

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For Release:

April 26, 1984

RELEASE NO. 84-29

STORAASLI, SOMERS RECEIVE NASA FELLOWSHIPS

Two aerospace engineers at NASA's Langley Research Center have been awarded Floyd L. Thompson fellowships for 1984-85.

Dan M. Somers, Transonic Aerodynamics Division, has begun a one-year stay at the Universitat Stuttgart in Stuttgart and at the Deutsche Forschungs- und Versuchsanstalt fur Luft -und Raumfahrt e.v. (DFVLR Institute for Design Aerodynamics) in Braunschweig, both in the Federal Republic of Germany. Dr. Olaf O. Storaasli, Structures and Dynamics Division, will leave for Norway in September to study at The Norwegian Institute of Technology in Trondhein and Det Norske Veritas in Oslo.

The Thompson Fellowship Program was established in 1977 to encourage the development of research potential among the Langley staff. The Fellowhip allows researchers who have demonstrated continued growth in research to spend up to 12 months at an educational or research institution. It is named in memory of Dr. Floyd L. Thompson, Langley Director from 1960 to 1968. Thompson joined the Langley staff in 1926, retired in 1968 and was a consultant to the NASA Administrator until January 1973.

While in Germany, Somers will develop a method for the design and analysis of medium-speed natural-laminar-flow airfoils. Somers has successfully designed two low-speed NLF airfoils by combining the high lift capabilities of the NASA low-speed airfoils

- more -

with the low drag characteristics of the NACA 6-series airfoils. He plans to extend this capability to subcritical Mach numbers, comparing the compressible Eppler Airfoil Design and Analysis Program, which Somers helped develop last year, to a competitive technique of DFVLR's Drs. Horstmann and Quast.

"The best approach for developing the method will be reached jointly by NASA and DFVLR through the comparison of the two approaches and through the evaluation of the methods by the theoretical design and experimental verification of candidate airfoils," Somers said. "First, the airfoil(s) will be tested at subcritical Mach numbers (medium speeds) in the DFVLR transonic wind tunnel to evaluate the predictive capabilities of the methods with respect to pressure distributions. Second, the airfoil(s) will be tested at low speeds in the Langley Low-Turbulence Pressure Tunnel to evaluate the predictive capabilities of the methods with respect to boundary-layer development. The low-speed tests will require that 'equivalent' airfoils be designed which will produce pressure distribution at low speeds corresponding to those which occur on the original medium-speed airfoils at subcritical Mach numbers."

Somers' proposed research activity directly supports one of Langley's primary goals—viscous drag reduction. Achievement of significant extents of natural laminar flow will result in substantial cost savings in the operation of commuter and business aircraft.

Storaasli's proposal is to develop parallel algorithms for solving nonlinear structural analysis problems suitable for implementation on the new generation of concurrent processing computers offering orders of magnitude reductions in analysis time.

Storaasli's research at Langley is focused on developing analytical and computational methods to solve large-scale linear and nonlinear structures problems rapidly and accurately via the Finite Element Method. An experimental multiprocessor

- more -

computer, the Finite Element Machine, is used in this research to explore different methods of solving structures problems in parallel.

His research in Norway would extend his work and requires a knowledge of parallel computing techniques and close collaboration with the developers of a modern comprehensive nonlinear finite element system. This research will result in a more general-purpose software capability based on reseach and development on the Finite Element Nonlinear Integrated System at the proposed sites. Storaasli said the institutes in Norway have for some time been recognized in the structures community for developing comprehensive finite element software to solve some of the largest and most complex structural analysis problems in the world.

"The proposed research is very timely in that it addresses the structural component of the new Langley concurrent processing initiative known as Technology for Integrated Program Solving (TIPS) and since the next generation of scientific computers under development have multiple processors," Storaasli explained. "I believe the close association with researchers with experience developing comprehensive large-order linear and nonlinear finite element analysis systems will result in an advanced large-order computational analysis capability that would not be as completely or rapidly achieved otherwise."

Storaasli has worked at Langley since 1970 and has specialized in computer and microprocessor hardware for solving engineering problems. He received a bachelor of science degree from Concordia College where he had a triple major of physics, mathematics and French. He received a master of science degree in mathematics from the University of South Dakota and a doctorate in engineering mechanics from North Carolina University.

He and his wife, Sukdee, and their two sons, live in Hampton.

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Somers began his Langley career in 1974 and is responsible for the design and experimental verification of natural-laminar flow airfoils for remotely-piloted vehicles, general aviation and commuter applications. He earned a bachelor of science degree in aeronautical and astronautical engineering from Purdue University.

Somers lives in Hampton.

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Maurice Parker
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For Release:
May 1, 1984

RELEASE NO. 84-32

DISCRETIONARY FUND LETS NASA RESEARCHERS 'TAKE A FLYER'

Most of the work at NASA's Langley Research Center is basic, mainstream research in the fields of aeronautics and space technology. Programs are approved, funded and monitored through a chain of managers and checklists.

Individual researchers with innovative, high-risk ideas for relatively small projects, however, do have an opportunity to pursue their ideas through a special, streamlined approach.

For the past several years, Langley and other NASA centers have been allotted a source of research money called the Director's Discretionary Fund. Langley Director Donald P. Hearth calls the fund "an effective tool in my efforts to enhance the research environment at Langley."

Director Hearth emphasizes the high-risk, high-payoff nature of the fund, and he continually seeks ideas for small research projects that are more venturesome or speculative than most mainstream Langley programs.

A portion of the 1984 Langley Discretionary Fund is alloted to 16 projects that were begun in 1983 and are continuing through this year. The rest of the fund is earmarked for novel ideas that must come from innovative researchers.

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The most positive aspect of the fund is the direct way in which proposals are reviewed and funded. The frustration of trying to clear ideas through several layers of management is eliminated because proposals are submitted directly to the Office of the Director.

Each proposal is reviewed by Robert Tolson, Langley Chief Scientist, and by selected peer researchers at Langley. If approved, a project is then funded and the researchers can go to work. The complete process usually takes less than one month.

The fund generally supports in-house research ideas, but collaborative projects with outside research organizations also can be funded through grants or contracts if the work is considered a valuable adjunct to Langley efforts.

The variety of projects being funded is illustrated by these examples:

o Dr. Jae Park is working on a new analysis technique for the retrieval of specie concentrations from laboratory and field interferometer spectra. His research has led to applying the technique to several mainstream research projects, including Langley's Halogen Occultation Experiment gas cell monitoring program; potential incorporation into computer analysis software for a Shuttle experiment being developed by the Jet Propulsion Laboratory in California; an agreement with Italian researchers to analyze balloon-borne instrument data; plus several articles in technical journals.

o Dr. Burton Northam and Charles McClinton have shown that an electrically driven plasma can be an effective igniter and flameholder in supersonic conditions. They simulated Mach 4 flight conditions (four times the speed of sound, where hydrogen will not automatically ignite) in an air heater and tried to deliberately "blow off" the flame. Their examination of plasma as an igniter and flameholder for scramjet aircraft will continue through this year.

- more -

o Dr. Bruce Wielicki and Dr. Charles Whitlock separately developed new approaches to improving scientific information from the Landsat satellites that study Earth's resources from space. Wielicki used digital information to derive an objective analysis technique that provides much more accurate statistical information on the physical properties of cumulous clouds than is possible with meteorological satellites. The information is important for climatology mathematical models, many of which make very coarse assumptions about cumulous cloud radiative effects. Wielicki's work is now partially funded by NASA's Office of Space Science & Applications (OSSA) in Washington.

Whitlock's research has developed a technique for inferring the optical depth of the atmosphere to within 10 percent from Landsat thematic mapper radiance measurements, using the near-infrared channels. He is seeking funding from NASA Headquarters to apply the technique during the next two years, when another Landsat thematic mapper satellite will be placed in Earth orbit.

o Two Langley Discretionary Fund projects received IR-100 Awards last fall from Industrial Research magazine, which each year selects the 100 most significant new technical products developed in the nation.

Charles Camarda and Algerd Basiulis developed a "heat pipe" concept that alleviates excessive thermal stresses by combining the thermal efficiency of heat pipes with the structural efficiency of honeycomb sandwich construction.

Harlan Holmes developed a device to investigate the integrity of bonding material that is sandwiched between the Shuttle Orbiter's metallic skin and its ceramic thermal protection tiles.

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For Release:

May 16, 1984

RELEASE NO. 84-33

WHIPPLE SELECTED ASSISTANT CHIEF, FABRICATION DIVISION AT NASA LANGLEY

Douglas W. Whipple has been named Assistant Chief of the Fabrication Division at NASA's Langley Research Center.

In this position, Whipple participates in planning, developing, directing, programming and evaluating technical services to fabricate research test models and associated systems and equipment in support of center project and program requirements. He is responsible for the continuing development of processes, procedures and programs for improving fabrication methods and practices, including numerically controlled and computer-aided manufacturing systems and equipment.

In addition, he develops and manages the Division Institutional Management System for funding; serves as a consultant on RTOP review, manpower resource requirements and commitments, hardware make-or-buy decisions, task schedules and priorities, and manufacturing feasibility; participates in the overall administration of contracted fabrication services; and represents the division on various technical and administrative panels and committees.

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Whipple joined the Langley staff in 1958 as an electronic instrument maker apprentice. He graduated from the Langley Apprentice School in 1963 and has served as an electronics technician, electronics technician supervisor, Head, Microelectronics Development Unit; Head, Electronics Technology Applications Unit; and Head, Task Contracts Group. He has specialized in development of thick and thin film microelectronic circuits.

Prior to his NASA career, he was an advertising proof clerk for The Times-Herald/Daily Press. He served in the Army National Guard from 1961 to 1964.

A native of Newport News, Whipple has received several awards for his electronics work and holds a patent on a micro-circuit negative cutter.

Whipple, and his wife, Judy, live in Hampton. They have two daughters.

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For Release:

May 16, 1984

RELEASE NO. 84-34

NASA-LANGLEY MANAGERS ELECTED AIAA DIRECTORS

Members of the American Institute of Aeronautics and Astronautics have elected two Langley Research Center managers to key positions in the organization.

Richard H. Petersen, Langley's Deputy Director, has been named a Director-at-Large. Robert E. Bower, Director for Aeronautics, is the new Director-Region I. Both are associate fellows in the institute.

Petersen, one of six Directors-at-Large elected, will help guide the plans, policies and activities of the institute. In his candidate statement, Petersen said, "The strength of our aerospace industry is a key element in the strength of the United States. As we strive to further improve our profession and our organization, we contribute to the strength of our industry and the economic and military strength of our country. The challenges are to continue the increase in our membership, strengthen our sections and their activities, improve our national technical meeting, and contribute to aerospace education programs in our universities. A key task is to communicate the merits and needs of our profession to Congress, the media, and the public. As a Director-at-Large, I will work diligently with all of you to move the AIAA toward even greater excellence."

As Director-Region I, Bower is responsible for the northeast region, which contains the largest number of sections. The primary focus of the Directors-Regional is toward section activities and programs. Each Regional Director chairs the Regional

- more -

Advisory Committee, which coordinates activities within the region. There is a larger time and travel requirement for the Regional Directors than for other Directors.

Bower plans to visit the sections, student branches and universities to encourage young people to pursue the aeronautical profession. My current position with NASA provides me with a sobering challenge to further the aeronautical sciences and, particularly, to encourage young people to enter the aeronautical profession. The AIAA, with its sections and student branches, can and does play a significant role and it would be one of my prime objectives to expand and strengthen this role," he explained.

"We need to strengthen the sections and attract high school students into the aerospace profession. Possible approaches include scholarship funds, science fairs, awards for best papers and a speakers bureau. We could strengthen student branches by inviting them to section programs, letting them run one meeting, and having co-social events.

"In order to provide for expanded professional services to our members, I would support the workshops on financial and retirement planning and local continuing education courses. There is merit in establishing more technical committees at the section level, which could include the area of electronics, for example."

Bower said he views his position "as the sections' representative on the Board of Directors to act in their behalf."

Petersen began his NASA career at the Ames Research Center in 1957. In 1975 he became Chief of the Aerodynamics Division at Ames with responsibility for seven major wind tunnels. Since 1980, he has served as Langley's Deputy Director.

Bower joined the Langley staff in 1971. Previously he was Director of Advanced Development at the Grumman Aerospace Corporation, responsible for the corporate independent and contracted advanced technology program.

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For Release:
May 25, 1984

RELEASE NO. 84-36

ADAMS IS NEW CHIEF, PROGRAMS AND RESOURCES DIVISION AT NASA-LANGLEY

Dr. Belinda H. Adams, Assistant Chief, Programs and Resources Division since March 1981, has been selected as chief of the division at NASA's Langley Research Center.

In her position, Adams is responsible for helping center management plan and implement research and development programs and supporting requirements through analysis of the money, manpower and facility requirements of present and proposed programs; preparing budgets and program operating plans; monitoring the budget process; and supporting Langley divisions in resource policy and procedure.

Adams joined the Langley staff as an aerospace technologist in the Analysis and Computation Division in July 1963. From November 1970 to August 1973 she was an operations research analyst, working first in PRD and then in the Business Data Systems Division. While assigned there, she was responsible for planning and coordinating the training program for Langley's transition to a new generation of business computers. She became Assistant Head of the Institutional Programs Branch in August 1973 and branch head in April 1975.

Concurrently with her NASA employment, Adams was an assistant professorial lecturer at the George Washington University's Tidewater Center from 1970 to 1976.

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A native of Mississippi, Adams received an associate degree from Hinds Junior College, graduating with honors in 1961, and a bachelor of science degree in mathematics from the University of Mississippi in 1963. She received a doctorate in business administration with a speciality in quantitative methods from the University of North Carolina in 1972.

The author or co-author of four technical papers, Adams was a charter member and Past President of the Peninsula Chapter of the Society for Advancement of Management. She has received a Special Achievement Award and a Group Achievement Award, and in 1977 was NASA's nominee for the William A. Jump Memorial Award for distinguished career service in public administration. She served on the Center Task Team supporting a NASA Task Force on Performance Appraisal and Merit Pay, for which NASA received the first Udall/Derwinski Award for excellence in Civil Service reform implementation.

Adams recently completed service on the Langley committee tasked to provide the center's top management with "A Study of LaRC's Future." She has been selected by NASA for the OPM Executive Development Seminar to be held at Kings Point, New York, in July/August 1984.

Adams and her husband, William M. Adams Jr., live in Yorktown, Va. They have two daughters.

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For Release:

May 25, 1984

RELEASE NO. 84-37

CRIPPEN, HART RECAP SHUTTLE MISSION 41-C AND DEPLOYMENT OF LDEF AT SPECIAL NASA-LANGLEY COLLOQUIUM

Astronauts Robert L. Crippen and Terry J. Hart, who were the crew members responsible for the deployment of the Langley Research Center's Long Duration Exposure Facility during the last Space Shuttle mission, will speak at a special Langley colloquium Monday, June 4.

Commander Crippen and Mission Specialist Hart will describe their experiences during this dramatic mission using slides and movies taken during the flight. Their lecture will be held in the Activities Center, Building 1222, at 2:45 p.m., preceded by a press briefing at 2 p.m.

The Space Shuttle Mission 41-C began at 8:58 a.m. EST Friday, April 6, 1984, with the direct insertion of Challenger into orbit. The following day, the crew of five astronauts deployed the Langley-designed and -built LDEF, the largest object to be deployed using the arm of the Remote Manipulator System. On Tuesday, April 10, the Solar Max Mission satellite was captured with the remote arm and placed in the payload bay, where it was repaired on Wednesday, April 11, and put back into orbit early Thursday morning. The job was a complete success and an important first demonstration of the Space Shuttle's application for the repair of satellites in space.

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LDEF is scheduled to be retrieved from orbit by Space Shuttle Flight 51-D in March 1985 and returned to Earth for examination of data and experiments.

Crippen became a NASA astronaut in September 1969. He was pilot of the first Space Shuttle mission, and commander of STS-7 and 41-C. He is in training as commander for the STS 41-G mission scheduled for fall of 1984. He was a member of the astronaut support crew for the Skylab 2, 3 and 4 missions and served in this same capacity for the Apollo-Soyuz Test Project mission, which was completed successfully in July 1975. Crippen also was a crewmember on the highly successful Skylab Medical Experiments Altitude Test—a 56-day simulation of the Skylab mission, enabling crewmen to collect medical experiments baseline data and evaluate equipment, operations, and procedures.

Hart was selected as an astronaut candidate in January 1978. He completed his training and evaluation period in August 1979 and was a mission specialist on STS-41-C. Hart was a member of the support crews for STS-1, -2, -3 and 7 an Ascent and Orbit CAPCOM with the Mission Control Team for those flights.

Hart will leave NASA June 15 to return to private industry. He will work in an engineering management position for the newly-formed Military and Government Systems Division of Bell Laboratories in Whippany, N.J. That division will produce large digital communications networks for government applications.

NOTE TO EDITORS: A good photographic opportunity will be available from 1 to 2 p.m. when the astronauts will tour the Fabrication Division shops and informally meet the shop personnel who built the LDEF. Call Jean Saunders, 865-3006, to cover this activity.

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For Release:

May 25, 1984

RELEASE NO. 84-38

ABLE TO ADDRESS STUDIES OF BIRD NAVIGATION AT NASA-LANGLEY COLLOQUIUM

Migratory birds possess a variety of direction-finding mechanisms: sun, stars, magnetic compasses, skylight polarization patterns and wind direction, according to Dr. Kenneth P. Able, Associate Professor of Biology at the State University of New York at Albany.

At a NASA-Langley Research Center colloquium, Monday, June 11, Dr. Able will explain how these capabilities, complex as they are, will still not enable a bird to return over thousands of kilometers to a specific site, something we know they can do. Evidence suggests that this feat requires not only a compass sense, but also an analog of a map. Current theories are a map based on odors or one based on magnetic field gradients.

Able's lecture will be held in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15 p.m.

Able, who has conducted field research on bird migration in Louisiana, Georgia and New York, has employed tracking radar, visual observations, and tests of birds in orientation cages to explore the interactions among directional cues. These studies have emphasized the importance of cues available around sunset and wind direction in the

- more -

orientation of these migratory species. Studies of young birds have shown that both stellar and magnetic orientation are modified through experience early in life and the two cues appear to interact. The hierarchical relationship among orientation cues during early development may be different than in adult migrants.

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NASA News

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For Release:
May 31, 1984

RELEASE NO. 84-40

YOU'D NEVER GUESS HE'S 98

His voice is deep, his eyes are alert and his mind is full of wisdom and wit.

His name is Grant "Preacher" Hickson and he was born on May 4, 1886. He attributes his long life to "the mercy of God, never smoking anything except cotton leaves a few times and never drinking liquor, though I did drink a little apple wine now and then that my mother made."

He worked at what was then NACA Langley Research Center from 1926 to 1949 and his co-workers are the ones that named him "Preacher." The name stuck because he treated people with kindness and courtesy.

He said, "Manners will carry you farther than your money, so I try to be nice and courteous to everyone."

While working at Langley Hickson was a landscaper for 10 years and an airplane mechanic's helper for 13. Thirty-five years ago, at age 63, he had an accident on the job. He fractured his hip and elbow and was forced to retire because of medical disability.

"I stayed in the hospital for 150 days. I remember everybody coming to see me and saying, 'He's going to die, he's going to die,' but bless God, I out lived them all."

He doesn't remember hearing any talk about future NACA-Langley projects. "I didn't have time to listen to the bigshots talking business; I had to work."

He's worked all his life and said that people have it made now and don't know it.

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He leaned forward in his chair, "I came the hard way. We didn't have electric lights, but a torch lantern lamp. I would walk seven miles in the morning and by sunrise be picking strawberries. I would work until sunset without anything to eat and then walk seven miles back home."

He doesn't feel that this kind of work has harmed him either. In fact he believes that this is another reason he has lived so long.

He said, "A lazy person will go to pieces before a person who keeps busy. I never owned a car. I usually walked everywhere I wanted to go. I got some exercise instead of riding around in an automobile."

One of 10 children born on a farm in Lake City, S. C., Hickson remembers his father building a log cabin school house because there weren't many schools during the 1890's. As a result, Hickson, his brothers and sisters and the other children in the area were able to get an education. The teachers were people who had had some schooling elsewhere.

Though he learned a lot in school, he also learned a great deal from his father. He remembers one lesson well.

"I used to pull up the peanuts that my family grew on the farm and eat them. My father noticed that they were missing. Bless God, I was stealing peanuts and my father saw me. Later he asked me if I had stolen them and I told him 'no.' He took a switch and whipped me good. He told me, 'I didn't whip you for stealing, but for lying.' He knew that if you learn to lie, you'll learn to steal."

Hickson was in his 20's when he got married. He wore a $1.25 suit. "I was working cutting and sawing railroad cross ties then."

Soon after World War I began, Hickson, his wife and two baby sons moved to Boston. He worked as a carpenter foreman and soon the Hickson's had a baby girl. A few months after, Hickson's wife died in the flu epidemic. She died in Nov. 1918, four short years after they were married. He was left with three children to raise on his own.

Hickson wanted his children to have a good education so he contacted George P. Phenix at Hampton Institute about admitting his boys to a work-study program. Phenix told him to come to Hampton and he'd admit them. Hickson came, but never saw Phenix because he had died the weekend before Hickson arrived. No one knew of Phenix's plan, so Hickson walked from place to place looking for a job. He finally found one as a carpenter. When that job ended, NACA-Langley had just began.

"I went over there. Mr. Edward Sharp told me they didn't have a thing. I told him about me trying to raise the children. He rared back, put his hands on top of his head and said, 'Go tell Lester Forrest to find some work for you to do.'"

He did just that and got a job pushing a wheelbarrow and landscaping that paid $3 a day.

He got a $500 loan and bought the land that his house now stands on. He planted a garden and pushed a wheelbarrow full of vegetables around town in his spare time. The money he got from selling these vegetables went towards paying the loan back.

When all of his kids were grown, he decided to build himself a house. He lived in a tin-roofed shed for three years while he and another man built the house that he now lives in.

"I learned that when you're down and out, you have to have the guts to come back up; if you don't have the guts you're going to stay down and out."

He had the guts and it's a lovely house. The yard is full of flowers and vegetables which Hickson planted and takes care of with the help of his grandchildren and his son, and will continue to do so "by the grace of God."

Soon after he finished the house, he met and married his present wife of 39 years, Mabel Hickson.

Mrs. Hickson rubbing him on top of his head said, "All the ladies at church kiss his bald head. He just loves it."

He laughed, "That's helped me live longer too."

- end -

NASA News

National Aeronautics and
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For Release:
June 5, 1984

RELEASE NO. 84-41

NASA-LANGLEY ASSISTANT DIVISION CHIEF RETIRES

William B. Jones, Assistant Chief of the Instrument Research Division at NASA's Langley Research Center, has announced his retirement, effective June 29. He will retire with more than 40 years of government service.

Jones has coordinated the instrument support activities and managed about 170 division personnel since 1970. At Langley since 1952, he has served as an engineering intern, a section head and a branch head.

Before coming to Langley, Jones served in the Army Corps of Engineers from 1946 to 1948.

Jones graduated from Greenwood High School in Greenwood, S.C. He received a bachelor of science degree in electrical engineering from North Carolina State University in 1952.

He and his wife, Nan, live in Yorktown, Va. They have two children.

- end -

NASA News

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For Release:
June 8, 1984

RELEASE NO. 84-42

NASA-LANGLEY HOSTS GOVERNOR'S SCHOOL FOR THE GIFTED

Twenty-five Virginia high school students will spend six weeks at the Langley Research Center this summer performing "real life" science and engineering tasks under the direction and guidance of NASA mentors.

Beginning June 18, 15 boys and 10 girls will participate in the Governor's School for the Gifted. These students possess a high level of ability in mathematics and science and have demonstrated outstanding achievement in these areas.

Approximately 700 students from across the state are nominated for the Governor's School programs hosted at various state colleges and universities. From the 700 nominees, 450 are selected to participate in the summer experience, 125 of them assigned to the program hosted by Langley. Selections are based on grade point average, extra curricular activities, teacher recommendations and a written paper.

This is the third summer Langley has served as a host to the Governor's School, sponsored by the Virginia Department of Education. The NASA program is based upon a mentor-model. Each student is selected by a NASA scientist or engineer and works under the direction and guidance of that individual. One of the objectives of the program is to offer "real life" career exploration to bright students who are considering careers in science or engineering. During the six weeks, the students are housed on the campus of Hampton Institute and participate in appropriate evening and weekend activities.

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The NASA mentors are the key to the success of the program. They are volunteers who have participated in orientation sesssions relating to the personality characteristics and psychological needs of gifted high school students. Each mentor serves as a role model for the students and has a tremendous impact upon the future of his or her protege.

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For Release:

June 14, 1984

RELEASE NO. 84-44

LOUIS F. VOSTEEN HAS BEEN SELECTED CHIEF, MATERIALS DIVISION, AT NASA'S LANGLEY RESEARCH CENTER

In this position, Vosteen heads the division that conducts research on advanced structural materials, such as metals, polymers and composites; structural characteristics of materials; damage tolerance and integrity of aerospace vehicle structures; and applying advanced materials to aircraft and and space vehicles.

Vosteen began his Langley career in 1952 as an aeronautical research intern. He served as Head, Experimental Structures Section; Head, Thermal Protection Section; Head, Thermal Protection Materials Branch; Manager, Composite Primary Structures Project Office; and Chief Engineer, Office of Director for Structures. From 1980 to 1984 he was Assistant Chief, Materials Division, managing research and development efforts on metallic and nonmetallic structural materials for aircraft and spacecraft. In January 1984 he was named Acting Chief of the division.

A native of Indiana, Vosteen graduated from Lakeville High School, Lakeville, Ind. He earned a bachelor of science degree in civil engineering from Purdue University in 1952. He received a master of science degree in applied mechanics from Virginia Polytechnic Institute in 1955.

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The author or co-author of over 30 technical publications, Vosteen received a NASA Exceptional Service Medal in 1982 "in recognition of technical leadership and exceptional contributions in advancing structures and materials technology for thermal protection systems and in bringing composite structural materials technology to a state of commercial aircraft use."

Vosteen is a member of the American Institute of Aeronautics and Astronautics, the Society for Experimental Stress Analysis and the Society for the Advancement of Material and Process Engineering.

Vosteen is married to the former Annette Threlkeld and lives in Williamsburg. They have three sons.

- end -

NASA News

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For Release:

June 19, 1984

RELEASE NO. 84-45

NASA RECEIVES AN AWARD IN LIGHTNING RESEARCH

NASA's Langley Research Center has been selected to receive an award for efforts in direct strike lightning research, using a specially instrumented F-106B airplane. Langley was selected by the National Interagency Coordination Group (NICG) on Lightning and Static Electricity, to receive their annual award for "Outstanding Contribution for Lightning Characterization and Aircraft/Lightning Hazards Definition."

The award will be presented at the 1984 International Aerospace and Ground Conference on Lightning and Static Electricity in Orlando, Florida, June 27, 1984. This conference is sponsored by the NICG, which consists of members from the U.S. Air Force, U.S. Navy, U.S. Army, NASA, National Oceanic and Atmospheric Administration, and Federal Aviation Administration.

This award is annually given to an outstanding individual or organization for technical contributions for research in the area of lightning hazards to aircraft and related electromagnetic compatibility.

NASA studies of lightning have resulted in a better understanding of how lightning effects aircraft. After more than 700 storm cloud penetrations and 400 direct lightning strikes to a specially-instrumented jet airplane, scientists at Langley are begining to understand more about lightning at flight altitudes and how it effects aircraft and aircraft flight.

- more -

On average, lightning strikes each commercial transport airplane about once per per year with little effect. These aircraft are protected by their aluminum skins, which are natural conductors, and by the use of mechanical-hydraulic control systems which are immune from the electromagnetic effects of lightning.

Future aircraft skins may be made of composite materials, which are non-conductors, and may need some form of additional protection from lightning. Lightweight composite materials promise a substantial savings in fuel expenditures and reduced operating costs.

Future aircraft also will use electronic control systems and digital avionics systems for improved flight efficiency and further savings of weight and fuel. However, lightning protection techniques need to be defined to avoid possible damage or upset to these low-voltage, highly sensitive electronic systems.

The physics of lightning has been studied for years by many scientists, but relatively little is known about lightning at typical operating altitudes of airliners.

Though much is yet to be learned about the internal micro-mechanism of lightning, Langley reserchers have already reported significant findings. Current rates of rise that approach 100 billion amperes per second have been recorded on the F-106B nose boom, for example. Data like this will be used by the technical community in establishing updated lightning protection criteria for aircraft.

Research in the Storm Hazards program at Langley and NASA's Wallops Flight Facility, Wallops Island ,Va., is proceeding on a broad front, looking at all aspects of lightning pertaining to aircraft flight. The F-106B airplane also collects data supporting research studies of turbulence, wind shear, heavy rain effects and other storm factors.

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NASA News

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H. Keith Henry

Release No. 84-48

For Release:

June 25, 1984

GENERAL AVIATION CONFERENCE TO HIGHLIGHT TECHNOLOGY ADVANCES

Recent technology advances in general aviation will be highlighted at a gathering of government, industry and university representatives at NASA's Langley Research Center, Hampton, Va., July 10-12.

The conference, jointly sponsored by the American Institute of Aeronautics and Astronautics (AIAA) and NASA, is the first AIAA conference specifically devoted to general aviation.

The "AIAA/NASA General Aviation Technology Conference" will include invited papers in the major technical areas with each session beginning with a keynote presentation on an aircraft currently in development. The five technical sessions include Aerodynamics and Flight Dynamics; Materials and Structures; Propulsion and Acoustics; Operations and Environment; and Avionics, Controls and Human Factors. The new aircraft development presentations planned include the Beech Starship 1, Lear Fan Model 2100, Mooney M301 and Gulfstream-Aerospace G-IV.

A special evening session entitled "Evolution of a New Generation of Light Personal Aircraft" will be held July 11 at 7:30. This session is free and open to the public. It will address rapid developments in areas of ultra-light and homebuilt aircraft, application of composite structure, and potential for a new class of primary aircraft.

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This special session will be chaired by Professor Hubert C. Smith, Pennsylvania State University and include presentations by representatives of Ohio State University, U.S. Army Aviation R&D Command, Army Structures Laboratory (NASA Langley), and the Airline Operators Pilot Association. The session will be held in the NASA Langley Activities Building, where the daytime sessions will also take place. Several light aircraft will be on display.

A general aviation conference in 1984 is timely because last year was a turning point in applying new technology. General aviation manufacturers unveiled new high-performance single-engine aircraft that, taken as a group, use the full range of piston, turboprop and turbofan engines. Both evolutionary and revolutionary changes in the twin turboprop arena were introduced and major performance and efficiency advances were demonstrated on many turbofan business twins.

Tuesday, July 10, aerodynamics and flight dynamics presentations will be "Advanced General Aviation Development Programs," Beech Aircraft Corporation; "Industry Perspective of Opportunities in Aerodynamics and Flight Dynamics," Cessna Aircraft Company; "Performance Trades of Two-and-Three-Surface Configurations," Gates-Learjet; "Status of Natural Laminar Flow Research," NASA Langley; and "Wing Design for Spin Resistance," NASA Langley.

Tuesday afternoon, July 10, materials and structures presentations will be "Status of the Lear Fan 2100 Development Program," Lear Fan; "Performance of Two Load-Limiting Subfloor Concepts in Full-Scale General Aviation Airplane Crash Tests," NASA Langley; "Dynamic Test Behavior of General Aviation Seats," FAA Civil Aero-Medical Institute; "The U.S. Army Advanced Composite Airframe Program," U.S. Army Applied Technology Laboratory; and "Citation III Bounded Structure," Cessna.

Wednesday, July 11, propulsion and acoustics presentations will be "An Overview of NASA Intermittent Combustion Engine Research," NASA Lewis Research Center; "The CT-7 Turboprop Engine," General Electric; "Garrett's F-109 1500 lb Fan Jet," Garrett

Turbine Engine Company; "Propeller Requirements for New Look Turboprop Business Aircraft," Hamilton Standard Division; and "Acoustic Prediction Methods for the NASA Generalized Advanced Propeller Analysis System," NASA Langley.

Wednesday afternoon, July 11, operations and environment presentations will be "Status of the Mooney M-301 Development Program," Mooney Aircraft Company; "Flight and Wind Tunnel Tests of a Electro-Impulse De-Icing System," Wichita State University; "Status Report on the Modernization of the ATC System," FAA Langley Field Office; "Lightning Effects on Adhesively Bonded Structures in General Aviation Aircraft," Lightning Technologies, Inc.; and "Characteristics of Lightning Strikes Experienced by the NASA F-106B Airplane," NASA Langley, University of Oklahoma, Lightning Technologies and NASA Wallops.

Thursday, July 12, avionics, controls and human factors presentations will be "Gulfstream IV Advanced Cockpit: Intregrated Flight Management System," Gulfstream Aerospace Corporation; "Applications of Speech Recognition and Synthesis in the Single Pilot IFR Cockpit," Honeywell Systems and Research Center; "Control and Display Requirements for Single Pilot IFR," Systems Technology, Inc.; "Advanced Avionics Systems and Cockpit Automation: The Pilot's Perspective," NASA Langley; and "Sidestick Controllers for General Aviation Aircraft: A Feasibility Study," University of Kansas.

For further conference information telephone Professor David Downing, University of Kansas, (913) 864-4267 or Louis Williams, NASA Langley, (804) 865-3611.

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For Release:
July 2, 1984

RELEASE NO. 84-50

TENNEY PARTICIPATES IN HARVARD'S MANAGERIAL PROGRAM

Dr. Darrel Tenney, Head of the Applied Materials Branch at Langley, recently completed an intensive 14-week executive education program for middle managers at Harvard University.

The Program for Management Development, sponsored by the Graduate School of Business Administration, is designed to provide exceptional managers with a program that will enable them to develop resourceful solutions to the managerial problems they encounter as they grow with their organizations. Tenney was the first participant in 11 years from Langley to be chosen for this program by NASA's Executive Resources Board.

PMD is taught by full time Harvard Business School faculty, who not only teach PMD, but also devote their research time to the development of PMD instructional materials. The case method, pioneered by Harvard during more than 50 years of teaching, is the core of the PMD academic program. Some of the courses offered include financial decision making; marketing; managerial behavior and business, government and international economy.

- more -

Every participant in the school's executive education program must be fully sponsored by his or her employing organization. The committee will not consider an applicant without the employing organization's full acceptance of all the requirements of sponsorship.

In Tenney's class of 116 students, the average age of the participants was 37 years and the participants were middle to upper-middle managers who possessed five to 15 years of business experience. Twenty-one different countries were represented with almost as many different backgrounds as there were students. The students' backgrounds ranged from private sector to public and nonprofit sectors. The diversity of the participants backgrounds is part of the planned learning experience that is offered by the Harvard program, since it adds to the group discussions that are an important part of the case teaching method. The professors in the classroom act as catalist for class discussions. Tenney thinks that participation both inside and outside of class contributed a lot to his learning experience and found that strong peer pressure and competition from other students were his best motivators.

Because of the fast pace and intensity of the program, Tenney, even with his PhD, was required to study accounting, independently, before leaving for Harvard. Tenney said that when everyone arrived they had different areas of expertice, but after a couple of weeks of learning from each other and the faculty, everyone was working on about the same academic level.

The students lived in room-group suites with nine private rooms in each suite. Each suite had a conference area equipped with blackboard, screen, computer terminal and conference table, as well as a small social area. Each participant had a private bedroom-study with a private telephone. A room group consisted of eight or nine students who lived and studied together throughout the 14-week program. A normal day began with breakfast at 7 a.m. and ended with class preparation at 7:30 p.m. After preparing alone for several hours Tenney's room group gathered to discuss and work problems until 11 p.m. or midnight. Close ties were formed in Tenney's room group. Tenney found the seperation from his family was the most difficult part of the course, but he did say "without living and learning together you would miss the experience of the common setting."

Tenney hopes to use what he has learned to increase the productivity of his work group. One of the main things he learned through the program was "to get to the critical issues, sift through not-pertinent facts and - quicker to zero in on solutions to the problum." Tenney says that by gaining a better understanding of private enterprise and their managerial system taught him to be a better manager at Langley. The program teaches skills the managers can use in their present job, as well as skills that apply to future managerial jobs.

Dr. Earle K. Huckins III, Head of the Large Space Antenna Systems Technology Office, has been chosen by the Executive Resources Board as Langley's next participant in the PMD program, beginning in December.

- end -

NASA News

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For Release:
July 10, 1984

RELEASE NO. 84-51

NASA-LANGLEY PROVIDES SPEAKERS, EXHIBITS IN EAA AIR SHOW

The Langley Research Center is one of five NASA centers participating in the 32nd Annual Experimental Aircraft Association Convention and Sport Aviation Exhibition July 28 through August 4 in Oshkosh, Wisc. NASA has participated in the annual convention for more than a decade and will be one of the chief exhibitors and technical participants at the show.

Speakers and displays from the agency's three aeronautical centers—Langley, which emphasizes aerodynamic technology; Ames Research Center, Moffett Field, Calif., which specializes in flight testing; and Lewis Research Center, Cleveland, Ohio, NASA's lead aeropropulsion facility—will focus on the theme: "Research Enhances Aviation Safety and Performance." There also will be speakers from Goddard Space Flight Center, Greenbelt, Md., and Wallops Flight Facility, Wallops Island, Va.

NASA will have technical exhibits in areas of Aerodynamics, Propulsion, Structures and Operations/Human Factors. Aerodynamics exhibits will feature research in aircraft performance, stability and control, and configuration. Propulsion exhibits will cover engine, propeller and other propulsion research. Exhibits relating to structures research will present new materials research and testing for crashworthiness. Avionics, flight simulation and new information about flying in adverse weather conditions are

- more -

among the topics to be presented in the Operations/Human Factors exhibits. An exhibit on SARSAT, Search and Rescue Satellite, will also be featured.

The NASA exhibition area will also include a small theater which will offer audiovisual presentations as well as special public lectures on aerospace topics.

NASA's AEROVAN, a large walk-through traveling exhibit unit which tells the story of the first "A" in NASA—aeronautics, will also be featured.

At the nearby EAA museum, NASA will sponsor a hands-on exhibit featuring a real-time information system for cockpit display.

In addition to high technology displays, NASA will have flight research aircraft on static display during the convention.

The EAA's annual International Fly-In Convention and Sport Aviation Exhibition attracts approximately 800,000 participants each year, and about 14,000 aircraft fly in during the eight-day celebration of flight.

Langley employees serving as forum speakers during the convention and their topics are: Frank W. Cazier Jr., "Understanding Flutter - Its Causes and Cures;" H. Douglas Garner, "Homebuilt Instruments and Autopilots;" Louis J. Williams, "Making Laminar Flow Work for You;" Frank L. Jordan Jr., "Some Aerodynamic Considerations for Advanced Aircraft Considerations;" James M. Patton Jr., Lee H. Person Jr., and Wayne Lee, "Lessons Learned: A Decade of Spin Research;" Jack Parks and Susan Semancik, "Personal Computer Capabilities for Cockpit Displays."

- end -

NASA News

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For Release:

July 9, 1984

RELEASE NO. 84-52

GENERAL AVIATION AWARD TO NASA-LANGLEY RESEARCHER

Joseph W. Stickle has been selected by the American Institute of Astronautics and Aeronautics (AIAA) to receive the national organization's 1984 General Aviation Award. Stickle, chief of the Low-Speed Aerodynamics Division at NASA's Langley Research Center, Hampton, Va, was selected "for outstanding technical leadership in guiding NASA's general aviation research efforts."

The award was presented at the AIAA/NASA General Aviation Technology Conference, held at Langley July 10-12.

It is given annually to an individual for outstanding recent technical excellence leading to improvements in safety, productivity or environmental acceptability of general aviation.

A major part of Stickle's career has been devoted to identifying key national and agency aeronautics technology needs and assuring that those needs are addressed within the research community.

Stickle joined the Langley staff in 1959 as an aeronautical engineer. In 1970, he was selected to represent NASA on the aeronautics staff of the National Aeronautics and Space Council where he worked on national aeronautical programs, policies and problems. At the conclusion of that assignment, he returned to Langley to continue his work.

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The award citation reads, in part, "It is through Stickle's personal initiative, dedication, and knowledge of the general aviation industry and its technology needs that Langley has conducted important research programs in aerodynamics, structures, and guidance and control systems."

Through his efforts, effective research programs were formulated in general aviation crashworthiness, stall/spin resistance, drag reduction, interior and exterior noise reduction, airfoil design, advanced configurations, avionics displays, flight controls and aerial applications.

Improved technology resulting from this research is now being incorporated into several new aircraft in development. Crashworthy structural design technology is included in the new Mooney 301 and Cessna Caravan. Stall/spin protection is included in the wing design for the Beech B-36TC. Natural laminar flow (for drag reduction) is included in the design of the Mooney 301, Learfan 2100, Gates-Learjet/Piaggio GP-180, and Beech Starship.

Stickle is an active private pilot with an instrument rating and is vice president of the Aero Club serving Langley Air Force Base and NASA-Langley.

A native of Hampton, Va., Stickle earned a bachelor of science degree in physics from Wofford College in Spartanburg, S.C. in 1959. He and his wife, the former Peggy Darnell, have three children and live in Hampton.

- end -

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For Release:
August 1, 1984

RELEASE NO. 84-55

TWO NASA-LANGLEY MANAGERS GET ASSISTANT DIVISION CHIEF POSITIONS

Two managers at NASA's Langley Research Center have been selected as assistant division chiefs in their respective organizations.

Richard M. Boykin Jr., has been named Assistant Chief, Systems Engineering Division, and Joseph Guarino has been chosen Assistant Chief, Instrument Research Division.

Boykin will assist the chief in managing and administering the engineering functions necessary to support space and aeronautical development and research programs. Guarino will be directly involved in planning, directing and coordinating the division's effort in research, development and instrument support activities, primarily for Langley ground facilities.

Boykin began his NASA career in January 1963 as an aerospace technologist in the Flight Vehicles and Systems Division. He was Head, Experiments Systems Section, Systems Engineering Division, from July 1973 to October 1979 and Head, Aeronautical Systems Engineering Branch from October 1979 until he assumed his new duties. He has specialized in the design, development and testing of mechanical systems for rocket motors, rocket and space vehicles and payloads remote sensors, aircraft experiments and modifications, and wind tunnel models.

- more -

Before joining NASA Boykin was an engineer for I.E. DuPont in Camden, S.C., in 1962.

A native of South Carolina, Boykin attended Clemson University from 1955 to 1957 and received a bachelor of science degree in mechanical engineering from the University of South Carolina in 1962. He did graduate work at Virginia Polytechnic Institute in 1966 and 1968.

Boykin is a member of the American Institute of Aeronautics and Astronautics and served on its Space Processing Technical Committee from 1977 to 1979.

Boykin and his wife, Betty, live in Hampton. They have two children.

Guarino came to Langley as an Air Force officer from 1955 to 1957, serving a special assignment to NASA's predecessor, the National Advisory Committee for Aeronautics. After his Air Force tour, he remained at Langley working as a research engineer until 1963, when he was named Head, Force Instrument Section. From 1970 to 1975 Guarino was Assistant Head, Electro Mechanical Instrument Branch and in 1975 he was named branch head, where he remained until appointed to his new position. He has specialized in the development of electro mechanical instrumentation for ground research facilities and coordination of division activities for providing instrumentation and measurement systems for new facilities.

Prior to his NASA career, Guarino was an engineer at Bendix Corporation, Teteboro, N.J., from June 1954 to May 1955.

The author of seven technical presentations, Guarino received a bachelor of science degree in mechanical engineering from Rensselaer Polytechnic Institute in June 1954.

Guarino and his wife, Genevieve, live in Yorktown. They have three children.

- end -

NASA News

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Maurice Parker
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For Release:
August 7, 1984

RELEASE NO. 84-56

NEW NASA-LANGLEY LABORATORY IMPROVING FLIGHT ELECTRONICS

Futuristic transport aircraft are all but flying inside a new electronics simulation laboratory at NASA's Langley Research Center in Hampton, Va.

The Avionics Integration Research Laboratory (AIRLAB) is NASA's primary research facility for developing methods to evaluate highly reliable, fully integrated avionics (aviation electronics) digital control and guidance systems, particularly for transport aircraft.

As the nation's air transportation system continues to grow, so do problems concerning economics, the environment, energy efficiency, safety and operations. Continued growth places increased dependence on complex avionics systems that are required for critical aircraft flight tasks. Safety and economic benefits in particular must be proven before new systems can be fully incorporated into future aircraft.

The increasing complexity of aviation electronics systems requires multiple computer processors and adaptable equipment arrangements that provide safety and flexibility for both normal and faulty conditions. New requirements, however, also increase the complexity of validating avionics systems.

Langley's AIRLAB research is focused on the development and validation of new techniques of assessment that use simulations, emulations, analytical models,

- more -

experimental computer equipment (hardware) and computer programs (software). The techniques describe performance, predict reliability and judge the benefits of proposed digital electronic flight systems and technology.

Techniques are evaluated through rigorous mathematical analysis, trial runs and comparisons with predetermined results, and final application to candidate systems such as integrated fault-tolerant engine controllers and flight control systems.

Researchers can evaluate systems in all stages of development in the new laboratory and simulate electronic flight avionic systems for realistic validation of assessment methods and technology in a simulated flight environment.

The new laboratory contains three major areas. The largest is devoted to research on experimental systems. It features eight separate research stations and a central control and software development station. Each research station can simulate a particular avionics function, control experiments, and retrieve, reduce and display engineering information.

The central control station can coordinate, control and acquire data for experiments that require integration of part or all of the eight research stations. It is also a software development station and controls external data communications to other Langley simulation and central data computation facilities.

A data management system—located at the central control station with access from all other research stations—provides a common interface between researchers and AIRLAB's capabilities. The data management system keeps track of experiment configuration and information necessary to save and retrieve experiment results.

- more -

A second work area contains a diagnostic emulator (special computer) designed to aid reliability analysis and software verification of advanced avionic computer and digital systems. It can investigate design and validation issues at the lowest logical element of a digital device. Because of this ability, many design issues can be resolved before actual hardware is built.

The third AIRLAB area houses 11 minicomputer systems—each directly connected to one of the research stations—that provide computational resources to support research in the laboratory.

AIRLAB also features two developmental computer systems that are designed to explore fault-tolerant techniques for future flight-critical applications. Developed at Langley over the past several years, these computers are research test beds for AIRLAB validation studies.

All areas of the laboratory are interconnected by data networks and can work together or separately, depending on whether an experiment is concerned with a full system test or with tests of individual subsystems.

The AIRLAB building measures 29 by 24 meters (95 by 80 feet) in area and contains about 706 sq m (7,600 sq ft) of work space. About 35 Langley researchers and support people are assigned to AIRLAB.

- end -

NASA News

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For Release:
August 14, 1984

RELEASE NO. 84-59

NASA LANGLEY EMPLOYEES HONORED WITH SERVICE AWARDS

One hundred twenty-five NASA Langley Research Center employees with 45, 40, 35 and 30 years of government service have been honored with emblems and certificates during this fiscal year.

The 40- and 45-year pins were presented by the center director, the 35-year pins by the program directors and the 30-year pins by the division chiefs.

Receiving awards this year were:

FORTY-FIVE YEARS' SERVICE: Harper E. Van Ness.

FORTY YEARS' SERVICE: William A. Carmines, Claude W. Coffee Jr., Barbara J. Durling, Charles E. Feller, Charles E. Fiorella, H. Douglas Garner, Daniel R. Hamlin, Joseph L. Johnson Jr., John E. Knemeyer, Coolidge R. Presnell, Nathaniel R. Spaulding, M. Leroy Spearman, Albert B. Stacey Jr. and Charles N. Valade.

THIRTY-FIVE YEARS' SERVICE: George C. Ashby Jr., Hal T. Baber Jr., Gary K. Ballard, John H. Belveal, Peter T. Bernot, Charles L. Breckinridge, Clarence M. Cole, Norman L. Crabill, Kenneth W. Crocker, Paul W. Culotta, Billy B. Dancy, Opal G. Davis, Joseph F. Dixon, Henry S. Earl Jr.;

Charles E. Edmiston, Moody J. Firman Jr., Roland T. Frederick, Charles S. Gilliland, Earl C. Hastings Jr., James M. Henry, Charles W. Hopkins, Spence V. Inge Jr., Oscar Jennings, Lloyd S. Keafer Jr., George O. Kent;

- more -

Carol C. Kiser, Beverly W. Lewis, Charles R. Lewis, Harvey G. McComb Jr., Wallace J. Nelson, Merle S. Ott, George F. Palko, Charles L. Ruhlin, Fred M. Smith, Herbert F. Thornton, Richard T. Wilem, James L. Williams, Conrad M. Willis and E. Carson Yates Jr.

THIRTY YEARS' SERVICE: Emilio Alfaro-Bou, Earl R. Askew, Earl H. Andrews Jr., Kay S. Bales, Frank M. Ballentine Jr., Willie Barnes, Donald E. Barthlome, James Bene, Thomas Bentley, Roosevelt Borden, John D. Buckley, Henry T. Bunting;

Betty S. Burnes, Thomas O. Carmines Jr., Jacqueline L. Conrad, Dave F. Crockett, Edward A. Crossley Jr., Rex A. Current, Joseph G. Daniels, Steve W. Farmer Jr., Anthony R. Fecondo Sr., Arthur R. Friend, Ernest C. Hooper, Robert J. Huston, James H. Jones;

Robert A. Jones, Johnny E. Jordan, Robert J. Keynton, Charles L. Ladson, Annabelle R. Lanahan, Trafford J.W. Leland, Willie Lucento, Amy O. Lupton, Roxy J. Luthie, Robert F. Macklin, James C. Manning, Leonard S. Mayo;

John P. McPherson, Robert R. McWithey, Vernon K. Moore, Charles D. Nichols, Archie V. Norton, Harold A. Orr, Beverly L. Overman, Floyd A. Phaup, Elbert B. Powell Jr., Leonard T. Power, Carson C. Rector, Margaret A. Ridenhour;

C. Norwood Robeson Jr., Frank R. Robinson, James Scheiman, Ruby S. Sherwood, Stanley P. Shields, William A. Southall Jr., Bernard Spencer Jr., John P. Stack, P. Calvin Stainback, Bland A. Stein, Ernest Sutton Jr., George M. Summerfield;

Robert H. Tolson, John B. Tyler, Norma G. Vest, George M. Ware, Arthur F. Waynick Sr., Herbert L. Whitaker, Ellis J. White, Boyd H. Wilfong, Murray J. Wilson, Lloyd E. Yeatts, George R. Young, Richard F. Zasimowich and Joel K. Zoeffel.

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NASA News

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For Release:
August 20, 1984

RELEASE NO. 84-60

AUTOMOBILE AERODYNAMICS, TOPIC OF NASA-LANGLEY COLLOQUIUM

World-wide interest in vehicle aerodynamics, General Motors' use of rented aircraft wind tunnels and the design and construction of the GM full-scale automotive aero tunnel will be discussed at a Langley Research Center colloquium, Tuesday, August 28.

Kent B. Kelly, General Motors Technical Center, will give a broad overview of vehicle aerodynamics as historically and currently used by General Motors. His talk, "General Motors Vehicle Aerodynamics," will be held in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15.

In his lecture, Kelly will use extensive visuals, including a video taped tour of the new GM tunnel and the Chevrolet Citation IV research vehicle. He will also discuss current test techniques and selected advanced GM aero research vehicles.

Employed by General Motors Corporation since 1957, Kelly is Manager of the Vehicle Aerodynamics Department, where he is responsible for aerodynamics test and development of GM future production and research vehicles. He has worked in vehicle aerodynamics and advanced vehicle concept projects. He was responsible for advanced engineering concepts including initial GM wind tunnel work and the design, construction and initial operation of the company's full-scale automotive aerodynamics wind tunnel.

- end -

NASA News

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For Release:
August 22, 1984

RELEASE NO. 84-62

HUCKINS TO ATTEND HARVARD'S MANAGEMENT DEVELOPMENT PROGRAM

Dr. Earle K. Huckins III, Head of the Large Space Antenna Systems Technology Office and temporarily assigned to the Space Station Office at NASA's Langley Research Center, has been chosen to attend the 1984 fall session of an education program at Harvard University.

The Program for Management Development is an intensive, 14-week program created by the faculty of the Harvard University Graduate School of Business Administration. Successful middle managers, whose future responsibilities in general management will demand skills and knowledge beyond their present expertise, are taught how to develop resourceful solutions to the managerial problems they will encounter as they grow with their organizations.

Huckins joined the Langley staff in 1962 as an undergraduate student trainee in Langley's Co-op Program. In 1966 he became an aerospace technologist in the Physics Division. From 1974 to 1978 he was Mission Integration Manager in the Long Duration Exposure Facility Project Office. From 1978 to 1979 he was LSST Program Manager in the Space Systems Division of the Office of Aeronautics and Space Technology at NASA Headquarters, Washington, D.C. He has specialized in space vehicle dynamics and control.

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A native of Newport News, Huckins graduated from Warwick High School in 1961. He received a bachelor of science degree in aerospace engineering from Virginia Polytechnic Institute in 1966, a master of mechanical engineering degree from North Carolina State University in 1968, and a doctorate in aerospace engineering from Virginia Polytechnic Institute in 1972.

The author or co-author of 18 technical publications, Huckins has received several Special Achievement Awards for his work. He is a member of the American Institute of Aeronautics and Astronautics.

Huckins and his wife, Cathy, live in Williamsburg. They have three children.

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Maurice Parker
804 865-2935

For Release:
August 22, 1984

RELEASE NO. 84-64

KENTRON DIVISION AWARDED NASA-LANGLEY SUPPORT CONTRACT

The Aerospace Technology Division of Kentron International, Inc., Dallas, Tex., has been selected by NASA's Langley Research Center for negotiation of a contract to provide technical support for aerospace research and development. Kentron's Aerospace Technology Division is located in Hampton, Va.

The incentive award fee contract will be for a period of three years, beginning October 1, 1984, and will have a dollar value of approximately $38 million.

Under terms of the contract to be negotiated, the Kentron division will provide technical support for most of Langley's aeronautics and space research programs, including low, transonic and high-speed aerodynamics; electronic flight dynamics, instrument measurements, flight electronics and control systems; space systems and atmospheric sciences; acoustics and noise reduction, materials, loads and aeroelasticity, structures and dynamics; projects involving multi-disciplinary aerospace systems; and systems and facilities engineering.

Most of the work will be done at the company's Hampton technical center, with certain special jobs done at Langley.

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For Release:
August 31, 1984

RELEASE NO. 84-65

VON BAEYER TO DISCUSS THE PLANNED NUCLEAR ACCELERATOR FACILITY AT A NASA-LANGLEY COLLOQUIUM

The design, scientific justification and impact of The Continuous Electron Beam Accelerator Facility on the region will be discussed at a Langley Research Center colloquium Monday, September 10.

Dr. Hans C. von Baeyer, Professor, Department of Physics, College of William and Mary, will speak in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15.

The Continuous Electron Beam Accelerator Facility in Newport News is a new accelerator for research and training in nuclear science. It will be constructed during the period 1985-1991 at a cost of $225 million. Its primary purpose will be to investigate the structure of the atomic nucleus by means of 4 GeV electrons, somewhat in the manner of a giant electron microscope. The timing of its construction is particularly appropriate because nuclear physics, for the first time in its 50-year history, is now based on a consistent theory capable of making detailed predictions. CEBAF will confront that theory, which makes use of quarks and gluons, with the experimental evidence.

- more -

von Baeyer was born in Germany and educated in Switzerland, Canada and the United States. His undergraduate degree is from Columbia University and his Ph.D. in theoretical physics is from Vanderbilt University in Tennessee. He has been at William and Mary since 1968 and has served as chairman of the physics department and Director of the Virginia Associated Research Campus. In 1973 he won the Thomas Jefferson Teaching Award, presented to one instructor every year at the College.

He has been a visiting scientist in Germany and Canada and has published widely in his field. His book on physics for the layman, "Rainbows, Snowflakes and Quarks," was published by McGraw-Hill Book Company this summer. He served on Governor Robb's Task Force on Science and Technology, which was charged with helping to bring high-tech industry into Virginia. von Baeyer is the Secretary of the Southeastern Universities Research Association, a consortium of universities that will construct the powerful nuclear accelerator in Newport News.

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NASA News

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For Release:
August 31, 1984

RELEASE NO. 84-66

STACK TO PARTICIPATE IN SIMMONS PROGRAM FOR WOMEN MANAGERS

Sharon H. Stack, an aerospace engineer in the High-Speed Aerodynamics Division at NASA's Langley Research Center, has been chosen through the NASA Fellowship Competitive process to attend a 10-week Middle Management Program for women at Simmons College beginning in September. The executive development program is designed to assist employers in industry, government agencies and the nonprofit sector in preparing qualified women for positions in middle management.

The principal teaching method used in the program is the case method. The development of these cases began in 1974 under a joint Simmons Graduate Program in Management/Harvard Business School case writing project.

The program emphasizes functional courses, such as accounting, finance, operations marketing, quantitative analysis, management information systems and economics that develop major skills required of any manager, and also offers behavioral courses which investigate specific issues that must be dealt with by women managers.

Stack began her NASA career in 1964 and has worked in high-speed aerodynamic research. She received a bachelor of science degree in mathematics and physics from Mary Washington College in 1964.

She lives in Yorktown, Virginia.

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For Release:
September 5, 1984

RELEASE NO. 84-67

NASA TO HOLD NTF HONOR AWARDS CEREMONY

A special awards ceremony, honoring individuals who worked on NASA's National Transonic Facility located at the Langley Research Center, will be held Tuesday, September 18, at Langley. The NTF is a unique national laboratory that will allow the United States to maintain its leadership in high-performance commercial and military aircraft, plus develop more efficient future transport.

James M. Beggs, NASA Administrator, will be the keynote speaker for the ceremony, which will begin at 1:30 p.m. in the Activities Center, Building 1222.

Beggs is the sixth man to head the nation's civilian space agency. He was nominated by President Reagan and took his oath as head of the agency July 10, 1981.

NASA Awards will be presented as follows:

Outstanding Leadership Medal: Robert R. Howell; Linwood W. McKinney; Robert L. Swain; and Robert H. Curtin, NASA Headquarters.

Exceptional Scientific Achievement Medal: Jerry B. Adcock; Edward C. Polhamus; and Michael J. Goodyer, University of Southampton.

Exceptional Engineering Achievement Medal: Donald D. Baals, Walter E. Bruce Jr., Charles E. Cockrell, William R. Cofer, E. Barton Geer, Joseph F. Guarino, Moses J. Long, James W. Ramsey Jr., George D. Ware and Nathan D. Watson.

- more -

Exceptional Service Medal: Charles S. Bryant, Hubert K. Clark, Blanche H. Fout, Dennis E. Fuller, Richard B. Holt, Floyd E. Jennings, Julius B. Lovell, Oran W. Nicks, Willaim R. Page, John S. Powell Jr., Donald H. Ward, L. Edward Williams, John F. Wilson, David A. Wineman, Richard W. Irwin of NASA Headquarters, and Quinton C. Davis IV, posthumously.

Public Service Medal: Thomas Hawkins of Metro Construction Company and Foster Kelly of Chicago Bridge and Iron Company.

Public Service Group Achievement Award: Chicago Bridge and Iron Company, Fluidyne Engineering Corporation, Metro Construction Company, Ralph M. Parsons Company and Sverdrup Corporation.

NASA Group Achievement Award: NTF Checkout and Shakedown Team and National Transonic Facility Project Management Team.

NASA Certificates of Appreciation: Albert M. Bast III, J. Lloyd Jones and Billie J. McGarvey, NASA Headquarters; Forrest B. Smith, Arnold Engineering Development Center; and Henry F. Weber and Harleth G. Wiley, posthumously.

Langley awards will be presented as follows:

Public Service Award: General Electric Company and Warren H. Greene, David I. Jett and R. Edward McKean of Kentron International.

Group Achievement Award: Fabrication Division; Fan Blade Design, Development and Test Team; National Transonic Facility Seal Team; NTF Data System Design Team; NTF Exhaust Plume Dispersion Team; NTF Instrumentation System Team; NTF Insulation System Design and Development Team; NTF Model Access/Gate Valve System Team; NTF Process Controls/Mathematical Modeling Group; NTF Structural/Thermal Analysis and Design Group; Operations Support Division; and Photographics Team.

The NTF is a cryogenic fan-driven transonic wind tunnel designed to provide full-scale Reynolds number simulation in the critical flight regions of most current and planned aircraft. It operates at Mach numbers from 0.2 to 1.2, stagnation pressures from 1 to 9 atmospheres (130 psi), and stagnation temperatures from 150 degrees Fahrenheit (air medium) to as low as -320 degrees Fahrenheit (cryogenic nitrogen).

Construction of the facility was completed in September 1982; shakedown operations started the following month, and maximum Reynolds number was obtained in May 1983. The total cost of the construction project was $85.8 million.

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NASA News

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For Release:
September 28, 1984

RELEASE NO. 84-71

NASA, AIAA SPONSOR AEROACOUSTICS CONFERENCE

NASA and the American Institute of Aeronautics and Astronautics will sponsor the 9th AIAA Aeroacoustics Conference October 15-17. The meeting, which will be held at the Fort Magruder Inn, Williamsburg, is expected to attract about 150 industry, government and university researchers from the United States and abroad.

The technical program, which appears in the August issue of "Aerospace America," includes 23 sessions and six workshops. Approximately 120 papers will be presented on topics ranging from computational aeroacoustics and propeller, rotor and engine noise, to human factors in aeroacoustics. Langley researchers will present 18 papers on recent studies conducted at the Langley Research Center.

An awards banquet will be held at the Jamestown Festival Park Tuesday evening, October 16, at which time the Aeroacoustics Award will be presented to Professor Geoffrey M. Lilley, University of Southampton, England, for his "major contributions to aeroacoustics research."

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NASA News

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For Release:
October 1, 1984

RELEASE NO. 84-75

BERENDZEN, SPEAKER FOR PUBLIC LECTURE SERIES

Lack of commitment to quality, diminished productivity, slackening of the work ethic, and deterioration of our most cherished institution, the family, have all contributed to problems in the American educational system and society at large, says Dr. Richard Berendzen, president of American University in Washington, D.C.

Berendzen will describe some of the problems involved in maintaining a quality educational system, and will outline solutions that are already being undertaken in various parts of the country at the "Our Future in the Cosmos" public lecture Tuesday, October 9. His lecture, "HOME, SCHOOLS, SOCIETY: Partners in America's Future" will be held at the Hampton Coliseum at 8 p.m. The public lecture series is sponsored by NASA and The College of William and Mary.

Berendzen contends that issues such as declining test scores, poor teacher preparation, and lack of discipline in schools, cannot be viewed in isolation. These problems reflect attitudes in the American home and workplace.

Believing that solutions to societies' problems may have much in common with improving our schools, Berendzen will review and share some of the recent advances and successes made in local school systems nationwide. Innovative ideas and a renewed

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commitment to excellence form the key to what each community can do to bring about a renaissance in American education.

An experienced public speaker with an important message, Berendzen's appearance presents a unique opportunity for parents, teachers and the general public to participate in a question and answer period after the lecture.

Berendzen, a noted astronomer, author, teacher and educator, has chaired numerous national committees studying the strengths and weaknesses of American education. He has also appeared as an education specialist on NBC News, the CBS Evening News, Nightline, Donahue, and the Today Show.

NOTE TO EDITORS: Berendzen will give the same lecture at a Langley colloquium that afternoon at 2 p.m., preceded by a press briefing at 1:15 p.m. The lecture will be held in the Langley Activities Center, Building 1222.

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For Release:
September 28, 1984

RELEASE NO. 84-76

NASA LANGLEY SELECTS COMPUTER ANALYSIS CONTRACTOR

Computer Sciences Corporation (CSC), El Segundo, Cal., has been selected for the negotiation of a contract to provide computational analysis and programming support services for NASA's Langley Research Center.

The contract will be worked through CSC's Applied Technology Division, Falls Church, Va. The cost-plus-fixed-fee contract to be negotiated has a potential lifetime of five years, and is valued at approximately $7.6 million.

Specific work will support basic and applied aerospace research through the Langley central computer complex, comprised of several large scientific computers and associated peripheral equipment that supports analytical and experimental research.

The Langley central computer complex includes mainframe computers provide interactive, batch and tape processing, interactive design, real-time simulation and research data reduction. Advanced analytical computation is possible in such special fields as fluid and structural dynamics, and an interactive graphics subsystem supports computer-aided design studies.

Many remote and interactive computer terminals located throughout the research center can be connected to the central computer complex.

CSC has been the primary Langley contractor for computer analysis and programming support services for the past dozen years. Most of the work will be done at Langley or in the company's Hampton office.

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Dr. Mary H. Lewis
AC 804-865-4323

For Release:

October 12, 1984

Release No. 84-77

NORFOLK SCHOOL SYSTEM AWARDED SPACE FOR SHUTTLE EXPERIMENT

Student researchers of the Norfolk Public School System will fly a "Getaway Special" experiment aboard a Space Shuttle in 1987 as winners of a southeast-Virginia area competition sponsored by the NASA Langley Research Center, Hampton, Va.

An official signing ceremony and press briefing will be held October 23 in the Langley Visitor Center at 10:30 a.m. Dr. Gene R. Carter, superintendent of the Norfolk Public School System, and Dr. Donald P. Hearth, Langley director, will formally announce the program and sign a memorandum of understanding outlining each party's roles and responsibilities.

The Norfolk Public School System was selected to fly an experiment as a result of a competition held during the 1983-84 academic year. Langley solicited proposals for potential Getaway Special experiments from 12 public school districts and 14 private and parochial high schools within a 50 mile radius of the center.

The Norfolk school experiment is a study of the force exerted by sound waves on a geometric object in a liquid. The micro gravity environment of space is required due to the difficulty of measuring the small forces exerted by sound waves on Earth.

The Norfolk Getaway Special project is managed by Kathleen R. Schoonmaker, Director of the Gifted and Talented Program for that city's public school system. The

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student research team is directed by Ronald C. Fortunato, a science teacher and space enthusiast.

Langley managers, scientists and engineers have volunteered to serve as mentors to the student reseachers.

Space for Getaway Specials, officially called "Small Self-Contained Payloads," is offered by NASA to provide opportunities to fly small experiments aboard the Shuttle. The experiments must be of a scientific research and development nature and are flown on Shuttle missions on a space-available basis. They are available to industry, educational organizations, domestic and foreign governments, and individuals for legitimate scientific purposes.

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For Release:
October 15, 1984

RELEASE NO. 84-78

NASA-LANGLEY TO HOLD WELDING, BONDING AND FASTENING SYMPOSIUM

NASA's Langley Research Center will host the Second Symposium on Welding, Bonding and Fastening October 23 and 25. The major theme of the symposium is "1990's Joining Technology for High Performance Aerospace and Hydrospace Structures."

The symposium provides a forum for the presentation of technical data pertinent to new methods and innovative techniques for joining advanced materials and structures. Sessions will be held on welding, brazing and soldering; mechanical fastening; explosive welding; selected joining techniques; adhesives: materials development and characterization, and programs, bonding processes and environmental effects.

Sponsored by the American Society for Metals, American Welding Society, Society of Manufacturing Engineers, George Washington University and NASA, the symposium will be held in the Activities Center, Building 1222, beginning at 9 a.m. each day.

General Cochairman of the meeting are Dr. John D. Buckley and Bland A. Stein. Other Langley participants include Charles P. Blankenship, George C. Firth, Vernon E. Watkins Jr., John W. Wallace, Dr. James W. Sawyer, Laurence J. Bement, Dr. Joseph S. Heyman, Sidney G. Allison, Robert F. Berry Jr., Dick M. Royster, Paul M. Hergenrother and Dr. Terry L. St. Clair.

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For Release:

October 16, 1984

RELEASE NO. 84-79

LANGLEY RESEARCH CENTER STAFF MEMBERS RECEIVE ADVANCED DEGREES

Fourteen NASA-Langley Research Center staff members have received advanced degrees through the center's Graduate Study Program during Fiscal Year 1984.

The program established in the late 1940s provides Langley scientists, engineers and administrators an opportunity to improve their proficiency in aeronautical and space research and earn advanced degrees while working at Langley. Approximately 860 employees have been awarded master's or doctoral degrees through the program.

Doctoral degrees have been awarded to the following four employees: Norman F. Knight, Structures and Dynamics Division, Doctor of Science in Civil Engineering from George Washington University; Thomas A. Shull, Flight Electronics Division, Doctor of Philosophy in Electrical Engineering from Old Dominion University; Steve M. Sliwa, Flight Dynamics and Control Division, Doctor of Philosophy in Aeronautics and Astronautics from Stanford University; and Kelli F. Willshire, Acoustics and Noise Reduction Division, Doctor of Philosophy in Industrial Engineering from North Carolina State University.

The Professional Degree of Engineering has been awarded to Geroge T. Carson Jr., Transonic Aerodynamics Division, from George Washington University.

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Master's degrees were awarded to the following nine employees: Don E. Avery, Loads and Aeroelasticity Division, Master of Science in Applied Science from George Washington University; Richard L. Campbell, Transonic Aerodynamics Division, Master of Science in Aerospace Engineering from George Washington University; Karen E. Jackson, an Army employee in Structures and Dynamics Division, Master of Science in Engineering Mechanics from Virginia Polytechnic Institute and State University; Brian J. Jensen, Materials Division, Master of Arts in Chemistry from The College of William and Mary;

John J. Korte, Facilities Engineering Division, Master of Science in Mechanical Engineering from Old Dominion University; Ajay Kumar, High-Speed Aerodynamics Division, Master of Engineering Administration from George Washington University; Grace C. Liu, Aeronautical Systems Office, Master of Science in Aeronautics from GWU; Elizabeth B. Plentovich, Transonic Aerodynamics Division, Master of Science in Mechanical Engineering from George Washington University; and Jeffrey P. Williams, Flight Dynamics and Control Division, Master of Science in Aeronautics and Astronautics from Purdue University.

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For Release:
October 16, 1984

RELEASE NO. 84-81

NASA-LANGLEY PERSONNEL TAKE ONE-YEAR ASSIGNMENTS

A temporary assignment to NASA Headquarters in Washington, D.C., for Jess G. Ross, Chief of the Research Information and Applications Division at the Langley Research Center, has created several reassignments within the center's Management Operations Directorate.

For the next year Andrew J. Hansbrough will be the Acting Assistant Chief, Research Information and Applications Division, and Ronald R. Krodel will serve as Acting Assistant Chief, Management Support Division. Hansbrough has been Assistant Chief, Management Support Division, since 1983. Krodel has been Head, Property Management Branch, since 1974.

Ross has accepted a one-year assignment as Project Manager, Telecommunications System. In this position, which is predominantly a contract effort, Ross will evaluate the existing telecommunications system and ascertain requirements for a new one. Prospective contractors will then recommend a number of communication systems to satisfy those requirements. In addition, Ross will chair the Source and Evaluation Board, which will recommend a vendor for the telecommunications system.

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The telecommunications system includes the telephone system; video conferencing; teleconferencing; and the metropolitan area communication system, which ties into other government agencies. The telecommunications system falls under the direction of the Associate Administrator of Management, C. Robert Nysmith.

Ross began his NASA career in March 1959 and has served as an employee development officer; awards officer; and Assistant Chief and Chief, Management Support Division.

Hansbrough has worked for NASA since 1964, serving as an administrative management intern; budget analyst; cost analyst; Head, R&D Programs Group; Head, Institutional Programs Group; Assistant to the Chief and Assistant Chief, Management Support Division; Head, Mangement Systems Analysis Office; and Head, Office of Equal Opportunity Programs.

Krodel came to Langley in 1959 and has been a procurement assistant, supply technician, contract administrator and a procurement agent.

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For Release:
October 22, 1984

RELEASE NO. 84-83

NASA-LANGLEY APPRENTICES TO GRADUATE

Twenty-one NASA-Langley Research Center apprentices will receive their journeyman certificates Friday, November 2, at the 40th Annual Completion Exercises for Engineering Technicians.

The ceremony will begin at 1:30 p.m. in the Activities Center, Building 1222.

Dr. Edgar M. Cortright, Langley Director from May 1968 until September 1975, will be the keynote speaker.

Eric R. Wynings, Electronics Technician in the Fabrication Division, will be the speaker for the Class of 1984 and Frederick M. Thompson, Coordinator, Engineering Technician Apprentice Program, Personnel Division, will present the certificates.

The graduates and their trades are:

Engineering Technician (Research Facilities Operations), Operations Support Division: William E. Wilkerson.

Electronics Technicians, Instrument Research Division: Joseph W. Lee and Bradley S. Sealey.

Engineering Technicians (Mechanical Development), Fabrication Division: Billy F. Allen Jr., John M. Bowman, Louis E. Simmons and Lanier Westbrook.

Engineering Technician (Fabrication Development), Fabrication Division: Jimmie R. Dail.

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Engineering Technician (Materials Processes), Fabrication Division: Ronald G. Hermansderfer.

Electronics Technician, Flight Electronics Division: Donald J. Reichle Jr.

Electronics Technicians, Fabrication Division: Emory T. Evans and Eric R. Wynings.

Electronics Technician, Analysis and Computation Division: Gregory A. Guarry.

Electrical Engineering Technicians, Operations Support Division: Michael D. Benbow and Roger W. Housman.

Engineering Technician Designers (Mechanical), Systems Engineering Division: Keith W. Davis and Jeffrey A. Jones.

Engineering Technician Designers (Mechanical), Facilities Engineering Division: Robert V. Kerns Jr. and Troy F. Middleton.

Engineering Technician Designer (Architectural), Facilities Engineering Division: James A. Phillip.

Aerospace Engineering Technician, Low-Speed Aerodynamics Division: Victor E. Sothcott.

Cortright, who resigned from NASA-Langley in 1975 to become Corporate Vice President and Technical Director of Owens Illinois Corporation, was responsible for Langley's aeronautical and space research programs as well as the center's facilities, personnel and administration. While Director, he also served as an advisor to the NASA Administrator on NASA programs.

He stayed at Owens Illinois until 1978 when he was named Senior Vice President for Sciences and Engineering at Lockheed. From 1979 to July 1983 he was President of the Lockheed-California Company. Since his retirement, he has returned to the Peninsula as a consultant and is working in land development.

Prior to his appointment as Langley Director, Cortright worked at NASA's Lewis Research Center in Cleveland, Ohio, from 1948 to 1958 and at NASA Headquarters in Washington, D.C., from 1958 to 1968.

Cortright became an internationally recognized authority on propulsion aerodynamics through his early work as an aeronautical research scientist. He made fundamental contributions to understanding the effects of boundary-layer flow on supersonic inlet performance, and the interaction of propulsive jets with external flow.

He was selected for a special team of scientists and engineers that developed the program plans and operating concepts for NASA in 1958. While at NASA Headquarters, Cortright served as Chief of Advanced Technology, Assistant Director for Lunar and Planetary Programs in the Office of Space Flight Programs, Deputy Director of the Office of Space Sciences, Deputy Associate Administrator for Space Science and Applications and Deputy Associate Administrator in the Office of Manned Space Flight.

Cortright served as Chairman of the Apollo 13 Review Board, which was established by NASA in April 1970 to investigate and document the accident to the spacecraft during the flight of Apollo 13, and has served on other high level committees for NASA and other government agencies, including the USAF Scientific Advisory Board.

A native of Hastings, Pa., Cortright received his bachelor and master of science degrees in aeronautical engineering from Rensselaer Polytechnic Institute in 1947 and 1949, respectively. He received an honorary doctor of science degree from George Washington University's School of Engineering and Applied Science in May 1973 and a doctor of engineering degree from Rensselaer Polytechnic Institute in June 1975.

Cortright lives in Yorktown, Va.

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NASA News

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H. Keith Henry

Release No. 84-84

For Release:

October 26, 1984

NOTICE TO NEWS PEOPLE: SHUTTLE 41-G LANGLEY EXPERIMENTS BRIEFING

A briefing on the status of selected Shuttle Mission 41-G experiments will be held Wednesday, Oct. 31, from 9:30 to 11:30 a.m., at NASA Langley Research Center, in Building 1202, Conference Room 246.

The principle investigator for each of Langley's four 41-G experiments will discuss the status of their respective experiments. Two of the experiments — Earth Radiation and Budget Experiment (ERBE) and Stratospheric Aerosol & Gas Experiment (SAGE II) — were deployed the first day of the mission, Oct. 5, on the Earth Radiation and Budget Satellite. The other two experiments — Measurement of Air Pollution from Satellites (MAPS) and Feature Identification and Location Experiment (FILE) — remained on orbit and returned safely to earth with Orbiter Challenger Oct. 13.

In addition to a status report, one or more investigators are expected to have some preliminary results to talk about.

Still photographs and color videotape released since the mission will be available to media attending the briefing. The visuals were taken by the astronauts on orbit and include new looks at the ERBS satellite deployment.

To locate the conference room, follow the directional signs to the Visitor Center (which is also in Bldg. 1202), but take the front door on the left half of the building. The stairway to the second floor is immediately inside the front door, at the left. At the top

- more -

of the stairs take a right. We will also be looking for you.

Participants will be:

Eugene Sivertson, FILE principal investigator

Dr. Henry Reichle, MAPS principal investigator

Dr. Patrick McCormick, SAGE II principal investigator

Dr. Bruce Barkstrom, ERBE principal investigator

- END -

NASA News

National Aeronautics and Space Administration
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For Release:
November 1, 1984

RELEASE NO. 84-85

JONES PARTICIPATES IN NASA'S SENIOR EXECUTIVE DEVELOPMENT PROGRAM

Robert A. Jones, Assistant Chief, High-Speed Aerodynamics Division at NASA's Langley Research Center, will be participating in NASA's Senior Executive Service Candidate Development Program for the next year.

The objective of the SESCDP is to provide NASA with highly qualified candidates to competitively fill SES positions. Jones has strong technical expertise in hypersonic airbreathing propulsion, hypersonic aerodynamics, engine-airframe integration and configuration development for aircraft, missiles and reentry vehicles. He also has expertise and considerable experience in developing and managing complex research programs.

Jones is assigned to the Defense Advanced Research Projects Agency in Arlington. "We believe that he will be able to make significant contributions to DARPA programs and that this is an excellent opportunity to strengthen the working relationship between our two agencies," John W. Boyd, Associate Administrator for Management at NASA Headquarters in Washington, D.C., said. "The experience of working with DARPA will be of great value to Mr. Jones and to NASA."

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Jones began his career with the National Advisory Committee for Aeronautics as an aeronautical engineer in May 1955. He has been Head, Entry Vehicles Configuration Section; Head, Aerodynamics and Heat Transfer Section; and Head, Hypersonic Propulsion Branch.

He received a bachelor of science degree in mechanical engineering from North Carolina State College in 1954.

He and his wife, Shirley, live in Newport News. They have three children.

- end -

NASA News

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For Release:
November 1, 1984

RELEASE NO. 84-86

KIVETT DESIGNATED ASSISTANT CHIEF AT NASA'S LANGLEY RESEARCH CENTER

William R. Kivett has been named Assistant Chief, Acquisition Division, at NASA's Langley Research Center. He shares with the chief responsibility for organizing, planning and directing the center procurement and contracting functions, and is the center's Deputy Procurement Officer.

Kivett began his NASA career in Janury 1964 as an aerospace technologist. He was named Head, Contract Administration Section in October 1973, and Assistant Head, Research and Technology Contracting Branch in December 1979. In January 1981, he became Head of the Contracts Branch with a later change to Assistant to the Chief in December 1983.

Before joining the Langley staff, Kivett worked for Western Electric Company, Burlington, N.C., from April 1951 to January 1964. He was an accountant, purchase agent, production coordinator, contract manager and Chief of the Contract Administration Section, Army Projects. He served in the U.S. Navy from May 1946 to 1948.

A native of Burlington, he received a bachelor of science degree in business administration from Elon College in 1951. He is a Certified Professional Contracts Manager. In November 1981, he was elected a Fellow by the National Contracts Management Association and is a member of the National Council of Fellows.

Kivett, his wife, Margaret, and two daughters live in Hampton.

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For Release:
November 1, 1984

RELEASE NO. 84-87

NASA HONORS EMPLOYEES AT AWARDS CEREMONY

NASA will honor employees who have made outstanding contributions in aeronautical and aerospace research during the past year at the Annual Honor Awards Ceremony Thursday, November 8.

Ann P. Bradley, NASA Associate Deputy Administrator, will be the guest speaker for the ceremony, which will begin at 1:30 p.m. in the Activities Center, Building 1222.

NASA awards will be presented as follows:

Outstanding Leadership Medal: Richard H. Petersen.

Exceptional Scientific Achievement Medal: Henry G. Reichle Jr.

Exceptional Engineering Achievement Medal: Ivan E. Beckwith, Laurence J. Bement, Perry W. Hanson, C. Michael Hudson, Jim J. Jones and Luat T. Nguyen.

Exceptional Service Medal: Leo P. Daspit Jr., Walter C. Hoggard, Robert R. Moore Jr., Robert E. Nye and Robert G. Thomson.

Equal Employment Opportunity Medal: William L. Williams.

Public Service Group Achievement Award: IPAD Project Industry Technical Advisory Board.

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Group Achievement Award: AIRLAB Development Team, Energy Efficient Transport Management Team, Interactive Design and Evaluation of Advanced Spacecraft Team, IPAD Project Team, Long Duration Exposure Facility Project Team and Space Station Concept Model Team.

Langley awards will be presented as follows:

H.J.E. Reid Award: Edward V. Browell, Arlen F. Carter, Scott T. Shipley, James H. Siviter Jr. and William M. Hall, Langley; Robert J. Allen and Carolyn F. Butler, Old Dominion University; and M. Neal Mayo, Kentron International, Inc.

Public Service Award: Klate Holt Company and Manuel J. Queijo, Bionetics Laboratories, Inc.

Outstanding Volunteer Service Award: Ronald K. Clark and J. Wayne Simonton.

Group Achievement Award: Advanced Transport Operating System Flight Control and Guidance Upgrade Team, CARE III Development and Validation Team, Compact Range Measurement Facility Development Team, Federal Acquisition Regulation Implementation Group, Gortler Experiment Team;

Helicopter Community Noise Study Team, High Resolution accelerometer Package Team, JVX Aeroelastic Model Test Team, Langley NEM Implementation Team, LaRC Anvil 4000 CAD/CAM Implementation Group, LaRC Global Tropospheric Experiment Team, Laser Heterodyne Spectrometer Award, LDEF Battery Power Team;

LDEF Design and Development Team, LDEF Verification and Launch Readiness Team, Mass Storage - Loosely Coupled Network Team, Multifunction Nozzle Technology Team, NLF Airfoil Design and Experiment Team, NTF Dedication Team and Tip-Fin Controller Assessment Team.

Bradley began her NASA career in 1973 as a Personnel Management Specialist at NASA Headquarters in Washington, D.C. From September 1974 to June 1975, she was a Princeton Fellow in Public Affairs and attended the Woodrow Wilson School at Princeton University through NASA's Executive Development Program.

When she returned from Princeton in 1975, she became Executive Assistant to George M. Low, then Deputy Administrator of NASA. From 1976 to 1979 she was Director of Administration at the Dryden Flight Research Center, Edwards, Calif., receiving the DFRC Director's Award in 1978. In August 1979, she was appointed Manager of the NASA Resident Office at the Jet Propulsion Laboratory in Pasadena, Calif.

Bradley returned to Washington, D.C., in April 1980 when she was appointed Deputy Associate Administrator for Management, receiving NASA's Exceptional Service Medal in 1982. She served in that position until she was appointed to her present position in August 1984. Earlier this year she graduated from the Advanced Management Program at the Harvard Business School, Boston, Mass.

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NASA News

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For Release:

Maurice Parker
804 865-2935

November 1, 1984

RELEASE NO. 84-89

NASA TO LAUNCH SECOND EARTH RADIATION BUDGET INSTRUMENT

A second set of Earth Radiation Budget Experiment (ERBE) instruments is scheduled for launch by NASA no earlier than November 8, 1984, aboard the NOAA-F meteorological satellite.

NOAA-F will take several instruments into Earth orbit in addition to the ERBE experiment. A 3,775-pound advanced Tiros-N spacecraft, NOAA-F will be launched at 5:42 a.m. EST from Vandenberg Air Force Base, Calif., atop an Atlas launch vehicle. It will be put into a 540-statute-mile, near-polar circular orbit inclined 98.86 degrees to the equator. Its orbital period will be 102 minutes, averaging 72 minutes in sunlight and 30 minutes in Earth's shadow. Once in orbit, it will be called NOAA-9.

ERBE is an atmospheric experiment that will increase knowledge of Earth's climate and weather systems, particularly how climate is affected by radiation from the Sun. The instruments, managed by NASA's Langley Research Center, consist of a Scanner (narrow field-of-view scanning radiometer) and a Non-Scanner (medium and wide field-of-view non-scanning radiometer).

- more -

The ERBE instruments will work in conjunction with a similar set of instruments that were deployed from the Space Shuttle October 5, 1984, aboard the Earth Radiation Budget Satellite (ERBS). A third set of instruments will be aboard the NOAA-G satellite, which is scheduled for launch in August 1985.

The three ERBE instrument sets will provide the most complete coverage to date for accurately measuring the amount of solar energy that is absorbed in different regions of Earth and the amount of thermal energy emitted back to space. Earth's radiation budget is the exchange of radiation between the Sun, the Earth and space.

NOAA-F's orbit will be Sun-synchronous and will precess (rotate) eastward about Earth's polar axis at the same rate and direction as Earth's daily rotation about the Sun. The satellite will be in a constant position with reference to the Sun, always crossing the equator at about 2:20 a.m. southbound and 2:20 p.m. northbound local solar time.

NOAA satellites collect meteorological readings and transmit information around the world for use in local weather analysis and forecasting. Information is also used in hurricane tracking and warning, agriculture, commercial fishing, forestry, maritime and other industries.

It is the sixth in a series of 11 satellites developed to give scientists comprehensive meteorological and environmental information. Built by RCA Astro-Electronics, Princeton, N.J., it cost $43.5 million; the Atlas launch vehicle, built by General Dynamics/Convair, San Diego, Calif., cost $11.4 million.

NOAA-F will be operated by the National Oceanic & Atmospheric Administration (NOAA) after orbit is established and after a complete checkout at NASA's Goddard Space Flight Center, Greenbelt, Md., responsible for launch aspects.

- more -

Other instruments aboard NOAA-F are:

o Advanced Very High Resolution Radiometer (AVHRR), a radiation detection instrument that monitors surface temperatures, cloud cover and vegetation.

o Solar Backscatter Ultraviolet Spectral Radiometer (Modification 2), (SBUV/2), that measures total ozone concentration in the atmosphere, vertical distribution of atmospheric ozone and irradiance of the Sun.

o ARGOS/Data Collection System (DCS), that gets data from about 400 buoys, free-floating balloons and remote weather stations that measure temperature, pressure and altitude, then transmit data to NOAA-F and a central processing facility in France.

o TIROS Operational Vertical Sounder Systems (TOVS), which consists of three instruments: a High-Resolution Infrared Radiation Sounder detects and measures energy emitted by the atmosphere to construct a vertical temperature profile from Earth's surface to an altitude of about 25 statute miles; a Microwave Sounding Unit detects and measures energy from the troposphere to an altitude of about six statute miles in all weather conditions; and a Stratospheric Sounding Unit takes measurements derived from radiance in the upper stratosphere.

NOAA-F will also carry special search and rescue equipment as part of an international life-saving program that uses satellites to rescue people from downed airplanes and ships in distress. The project, supported by Canada, France, the Soviet Union and the United States, began in September 1982. Nearly 300 lives reportedly have been saved since that time.

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NASA News

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For Release:

November 26, 1984

RELEASE NO. 84-90

TAGGE, SPEAKER FOR NASA-LANGLEY RESEARCH CENTER COLLOQUIUM SERIES

Gordon E. Tagge, The Boeing Commercial Airplane Company official responsible for planning, directing and controlling all technical and business activities of the NASA sponsored IDEA program, will speak at a colloquium at the Langley Research Center Monday, December 3.

Tagge will discuss "A 1990 Integrated Digital/Electric Aircraft" at 2 p.m. in the Activities Center, Building 1222. A press briefing will precede the lecture at 1:15 p.m.

Tagge says that the application of advanced systems technology has shown increasing promise for significant potential gains in airplane performance and deficiency. In late 1983, NASA initiated the Integrated Digital/Electric Aircraft (IDEA) programs, to determine the impact of extensive use of advanced electrical and digital systems on future aircraft. Tagge will discuss the objectives of the program, the basis for recommending the research and development necessary to implement IDEA concepts, the research programs recommended for high-risk, high-payoff areas appropriate for implementation under NASA leadership, and the application taking place by 1990.

Tagge has been with The Boeing Company since 1951. He has 33 years of experience in aircraft systems design, analysis and development, of which 15 years have been in engineering management. During that time he has had overall responsibility for system technology activities for secondary power systems, environmental control systems, actuation systems, avionics and flight deck systems, and air traffic control systems.

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November 26, 1984

RELEASE NO. 84-92

FRIEND HEADS NASA-LANGLEY EXCHANGE COUNCIL

Arthur R. Friend, Industry Relations Officer, has been named Chairman of the Langley Exchange at NASA's Langley Research Center.

The Langley Exchange promotes employee welfare and morale activities. It operates the cafeteria, reception and souvenir counters, and oversees employee activities such as banquets, dances, picnics and entertainment of official guests. It also fosters athletic events and other recreational activities. The five-member council, appointed by the Langley Research Center director, oversees the operations of the exchange. The chairman carries out policies established by regulations and directs the management of various branches of the exchange in accord with recommendations of the Exchange Council.

Friend has been with NASA since August 1958. He has been a budget analyst; Head, Budget Unit; and Assistant Chief, Programs and Resources Division.

He received a bachelor of arts degree in business administration from the College of William and Mary in 1958 and a master of public administration degree from Indiana University in 1968.

Friend and his wife, Merida, live in Williamsburg. They have one daughter.

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NASA News

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AC 804 865-2934

H. Keith Henry

For Release:
November 26, 1984

Release No. 84-94

IMPROVED WEAPONS CARRIER FLIGHT TESTED

An improved device for hanging weapons from the wings of lightweight fighter aircraft has been successfully demonstrated in recent flight tests at NASA's Dryden Flight Research Facility, Edwards, Calif. The device, an improved version of the standard pylon which carries weapons, extra fuel tanks and other items, is called a decoupler pylon.

The decoupler pylon allows an airplane carrying external stores to fly faster without encountering a dangerous wing motion called flutter. Bending and twisting motions of a wing can combine at certain speeds to cause flutter which, in turn, can result in structural failure. In extreme cases, a wing store (rocket/bomb/fuel tank) or an entire wing can be ripped off. Flutter involves these two different vibrations, normally at different frequencies, coupling to produce a single, strong vibration — similar to what a motorist feels when the vibration frequency of an unbalanced tire matches the vibration frequency of the suspension system at certain speeds.

Among its innovations, the decoupler pylon makes use of a spring to support the store, in contrast to the standard fixed pylon, so that motions of the store are less likely to effect the wing and contribute to the onset of flutter. In effect, the spring "decouples" the structural vibrations of the store from the wing, hence the name decoupler pylon.

The decoupler pylon tested by NASA is the first of its kind and was designed specifically to carry an 840 kilogram (2,250 lb) bomb on the wing of a General Dynamics

- more -

F-16 lightweight fighter aircraft.

Flight tests were conducted at Edwards, first with a standard F-16 pylon and then with the decoupler pylon, in level flight and in simulated maneuvering combat flight with high "g" (gravity) loading. With the standard pylon, flutter began at Mach .7 (about 515 mph) but was totally eliminated with the decoupler pylon up to Mach .95 (about 700 mph), the maximum speed tested, reports Bill Cazier of NASA's Langley Research Center, Hampton, Va.

"When carrying the stores with the standard pylon," he says, "the plane experiences continual, strong pounding vibrations. The pilot can't read the gauges on his cockpit display because the dials are a blur. But there were no objectionable vibrations when using the decoupler pylon." Cazier, who helps guide Langley's decoupler pylon work, is assigned to the Loads and Aeroelasticity Division.

There is no obvious difference in exterior appearance between the F-16 decoupler and standard pylons. Key structural elements of the decoupler pylon are a fixed upper portion attached to the wing and a movable lower portion to which the store is attached. The two parts are connected by a pivoting arrangement near the forward attachment point and the spring at the rear attachment point.

Modern fighter aircraft are required to carry a wide variety of stores in different wing locations, resulting in thousands of possible combinations on a single aircraft. Although flutter is undesirable and generally unsafe during normal aircraft operations, a few store combinations for the F-16 have flutter characteristics that permit a decoupler pylon flight research program to be conducted safely.

As a result, one store combination on the F-16 — represented (on each wing) by a particular missile on the wingtip, a particular heavy bomb near mid-span and a half-full fuel tank closer to the fuselage — has been the focus of NASA's research into the nagging problem of flutter on military aircraft.

In addition to eliminating flutter for this particular set of test conditions, the flight tests proved that a flexible pylon can keep a heavy store aligned with the wing during hard maneuvers — important for the decoupler pylon to be effective. The pylon has an automatic, low-power control system that helped to immediately return the store to its correct position whenever it became misaligned with the wing. At the conclusion of the last test flight, the test store — a simulated bomb — was dropped to demonstrate that a store could be ejected normally from a decoupler pylon.

The flight tests confirmed that by simply converting to decoupler pylons, the problem for this store combination would be eliminated on the F-16.

The flight results closely parallel analytical predictions and wind tunnel tests conducted at Langley, where NASA's decoupler pylon work is managed. Retired Langley engineer Wilmer H. Reed III, who conceived of the decoupler pylon and first tested it in the center's Transonic Dynamics Tunnel in the late 1970's, holds a NASA patent on the concept.

The decoupler pylon flight tests were conducted in cooperation with General Dynamics and the Air Force through the Air Force Flight Test Center at Edwards.

- END -

(NOTE: PHOTOGRAPHS L-79-1,184, L-84-4,754 (ECN 29536) AND L-84-4,753 (ECN 29533) ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY WRITING OR TELEPHONING KEITH HENRY AT AC 804-865-2934/2932. SPECIFY B/W OR COLOR.)

NASA News

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AC 804 865-2934

H. Keith Henry

Release No. 84-95

For Release:
November 27, 1984

LAMINAR AIR FLOW PROCESS KEY TO FUEL EFFICIENCY

The National Aeronautics and Space Administration is testing a concept of removing the layer of air molecules next to an aircraft's wing surfaces to increase the flight efficiency of transport aircraft.

During the cruise phase of subsonic flight, approximately one-half of the total drag slowing an aircraft is caused by air/skin friction, resulting in turbulent air flow. The NASA concept, called laminar (air) flow control, uses suction through porous wing surfaces to remove the turbulent air, thus maintaining smooth or laminar air flow and reducing drag and fuel consumption.

Laminar flow control is one of several technologies under study at NASA which promises significant fuel savings for commerical transport operators in the 1990's and beyond.

Two laminar flow control system concepts have been designed and fitted to a NASA JetStar four-engine light transport. The systems are located on the leading edge of each wing and are encased in metallic "gloves" at mid-wing. The gloves are perforated either by more than a million tiny suction holes or by narrow slots.

Lockheed-Georgia Corporation, Marietta, Ga., designed the test article installed on the JetStar's left wing. Construction is a sandwich of nomex honeycomb core and graphite epoxy face sheets, covered by a thin sheet of titanium bonded to the surface. Slots in the titanium sheet, a mere four one-thousands of an inch wide, run the length of the section and are the openings that draw air through the surface, through ducts within

- more -

the wing and into the fuselage.

Douglas Aircraft Company, Long Beach, Calif., designed the test article on the right wing. The Douglas concept, instead of being slotted, was perforated by an electron beam that drilled 800 precise, nearly microscopic holes per square inch of wing surface.

These subtle wing openings are expected to make a tremendous difference in how easily the test airplane slips through the air.

Researchers at NASA's Langley Research Center, Hampton, Va., where the agency's laminar flow control work is managed, point to studies of energy-efficient transports that could be built by the year 2000. One energy-minded transport configuration, already efficient by today's standards, would be 22 percent more efficient with the addition of laminar flow control, according to a Lockheed-Georgia study performed for NASA.

Laminar flow control is not a new concept. Since the 1930's, aerodynamicists have sought to devise a practical system, but the technology has proved elusive. Some systems have reached flight test status, but were judged impractical for operational service.

"We expect our leading edge flight test program to demonstrate that we can get good, maintainable laminar flow," says Langley's Richard D. Wagner, program manager. "Later work will extend the test region to much more of the wing, but it is the leading edge area that represents some of the greatest challenges."

Keeping the surface of these wings smooth and clean is crucial to maintaining laminar flow and is most difficult in the leading edge area, where insects and icing present special problems.

The remains of insects impacted by the wing, near ground level at takeoff and landing, can roughen the surface and clog the suction system. Icing, encountered in weather systems while climbing or descending from altitude, may have a similar effect.

Both concepts have built-in systems for keeping the wing surface clear of insects and ice. The Lockheed system pumps a cleansing fluid to the surface through the slots to make the surface too slippery for insects to easily stick. The fluid is also a freezing point depressant to limit ice build-up.

The Douglas concept uses a retractable insect shield deployed in front of the leading edge panel during takeoff, climb, descent and landing. The extended shield also increases wing lift. When not in use, the shield is stored in the underside of the leading edge box. In return, the Douglas concept sacrifices laminar flow benefits on the underside of the wing.

Wagner sees the dual use of the tiny surface openings as an efficient marriage of leading edge systems. "We don't expect to get laminar flow until the airplane approaches cruise conditions, after clearing the insect and ice zones. That's when we'll stop dispensing fluids and turn on the air suction system," he said.

After the leading edge systems on both test articles are tuned for their best performance, the airplane will be flight tested at various locations around the country at different times of the year to record effects of different weather and insect conditions. The airplane will be flown at cruise altitude on each flight to document the expected laminar flow. These simulated service flights will continue off and on throughout 1985, beginning with Cleveland as home base for a month this winter.

The ultimate objective of the JetStar flight program is to establish a technology base for future industry exploitation of laminar flow technology. The program is a cooperative effort between NASA's Langley Research Center and Ames/Dryden Flight Research Facility, Edwards, Calif., with industry participation.

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(NOTE: NASA PHOTOGRAPHS L-84-11,509 (ECN 27178) AND L-84-11,508 (ECN 30058) ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY WRITING OR TELEPHONING KEITH HENRY AT AC 804-865-2934/2932.)

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H. Keith Henry

For Release:
November 29, 1984

Release No. 84-97

SIMPLE CHANGES TO LIGHT PLANE WING INCREASE SAFETY

Up to 20 percent of all fatal light airplane accidents may be preventable with a wing modification developed through NASA research.

The modification, a simple but effective reshaping of part of an airplane wing, is a product of several years of research at NASA's Langley Research Center, Hampton, Va., and Ames Research Center, Mountain View, Calif.

Wind tunnel and flight tests of the reshaped wings reveal greatly increased resistance to airplane spins, a potentially dangerous flight condition that can result from wing stall (loss of lift). Aircraft stalls sometimes occur during improper takeoff, landing, and low-speed maneuvers.

"Light airplanes flying today are certified to federal aviation regulations — they are safe airplanes. NASA's goal is to make them safer," said Paul Stough of Langley's Flight Dynamics Branch. Present guidelines grant certification if a new airplane can be quickly brought under control after a one-turn spin. The Federal Aviation Administration is expected to decide in 1985 if special certification credit is to be issued for airplanes that are highly spin-resistant.

Langley is providing its research results to light aircraft manufacturers and to the FAA. NASA's approach to reducing the threat of spin in light planes has evolved to spin resistance because light plane spins typically occur at low altitudes with little time to recover.

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"This wing modification," added Stough, "is something that prevents the pilot from going out of bounds, so to speak, but doesn't interfere with the normal utility of the airplane. The only performance penalty we've seen is a negligble loss of one to two miles-per-hour in cruise speed, a difference most pilots are not likely to notice."

The wing modification is a carefully designed "glove" placed over the outer portion of the wing leading edge, covering about the first six inches of the upper surface and the first 18 inches of the lower surface. The glove is lightweight, has no moving parts and requires no maintenance.

At the glove juncture, there is an abrupt transition from the original leading edge to the recontoured area. The glove extends about two inches forward of the original wing. The extended leading edge area is drooped and more rounded than usual with a flattened undersurface where it fairs into the original wing, as developed for the three airplanes flight tested to date.

"With this wing design, Langley research pilots have pressed their light planes to (wing) angles of attack almost twice as high as normal before encountering any spin tendency. When the airplane gets to about 18 degrees angle of attack, instead of stalling and departing from controlled flight it gives the pilot indications that 'Hey, you shouldn't be operating up here,' yet it must be pushed beyond about 35 degrees angle of attack before the airplane will actually depart," said Stough.

Before they were modified, the three test airplanes would enter a spin about 18 of every 20 times the wings were stalled and pro-spin controls were applied. With Langley's wing leading edge design, the same planes entered a spin only once in every 20 attempts. The spins that did occur required improper airplane loading or extremely aggravated inputs by the pilot. The pilot generally had three to four times as long — measured in seconds — to make a correction before the plane entered a spin.

"The recontoured wing has greatly reduced the tendency for the airplane to spin and has given the pilot more time to take corrective action those few times when it is needed," concluded Stough. "We're not saying this wing leading edge design is the only way to provide spin resistance. Someone else may come up with a simpler, better or just different means of achieving the same thing, but this is a simple solution that works now," he says.

NASA's ultimate goal is to provide airplane designers with the ability to incorporate the modification as an integral part of a wing, rather than an add-on, and to provide the analytical tools to determine the amount of spin resistance for new airplanes — generalizing the solution for all conventional light airplanes.

The research is being expanded beyond the present series of unswept, low-wing airplanes to include high-wing airplanes and those with different airfoil shapes.

The first use of a spin-resistant wing design is expected to be on a new airplane design, not a modification added to existing airplanes. Wind tunnel model tests have been done at Langley to ensure the concept's compatibility with one promising wing design concept, called natural laminar flow, that may set new efficiency standards for the next generation of light airplanes. The tests indicate that the new natural laminar flow (low-drag) wings can also incorporate Langley's spin-resistant "discontinous wing leading edge" without loosing their laminar (very smooth) air flow.

Other wind tunnel work is proceeding for NASA at the University of Maryland, College Park, Md., to define the exact flow mechanisms responsible for making a modified wing so much more spin resistant. Researchers know that, at high angles of attack, the abrupt transition between standard and modified wing regions creates a horizontal tornado-like flow called a vortex that acts like a wall to prevent stalled (separated) air at the wing root from disrupting the flow on the outer part of the wing. The drooped leading edge tends to keep the flow attached longer to the all-important wing tip areas.

- END -

(NOTE: NASA-LANGLEY PHOTOGRAPHS L-83-1,568 and L-84-11,447 ARE AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY WRITING OR TELEPHONING KEITH HENRY AT AC 804-865-2934/2932.)

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AC 804 865-2934

For Release:

Maurice Parker
804 865-2935

December 10, 1984

RELEASE NO. 84-113

NASA-LANGLEY DIRECTOR DONALD P. HEARTH TO ACCEPT NEW POSITION AT UNIVERSITY OF COLORADO

Dr. Donald P. Hearth, Director of NASA's Langley Research Center, will become Director of Space Science and Technology at the University of Colorado in Boulder, effective March 1, 1985. The announcement was made this week from the university.

In a newly created position, Hearth will lead and coordinate university-wide comprehensive space science programs, including individual departments, research centers, and institutes involved in space-related research and instruction. He will report directly to university President Arnold R. Weber.

The University of Colorado is developing a broad-based program in space sciences and technology, according to Weber. In addition to its present strengths in basic space sciences, the university is planning to encompass an expanding range of space research and applications in engineering, computer and information sciences, telecommunications, Earth sciences, law, economics, and biosciences.

Hearth, 56, will leave NASA February 1, 1985. He has been Langley's Director since 1975. During his NASA career, he held several senior management jobs at NASA Headquarters, and he was Deputy Director of NASA's Goddard Space Flight Center before coming to Langley.

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For Release:
December 10, 1984

RELEASE NO. 84-114

PAUL HOLLOWAY NAMED NASA-LANGLEY DEPUTY DIRECTOR

Paul F. Holloway has been named Deputy Director of NASA's Langley Research Center, Hampton, Va., effective February 3, 1985. He has been Langley's Director for Space since May 1975.

As Deputy Director, Holloway will be general manager of the aeronautics and space research center, reporting to Richard H. Petersen, newly named NASA-Langley Director. Holloway will be responsible for directing research and technology programs and for institutional management of all facilities and equipment.

A native of Poquoson, Va., Holloway graduated from Poquoson High School in 1956. He earned a bachelor of science degree in aeronautical engineering from Virginia Polytechnic Institute in 1960, and did graduate study in physics at the College of William and Mary.

Holloway joined the Langley staff in June 1960 as an aerospace research engineer. He became Head of the Systems Analysis Section, Applied Physics Division, in 1969, and Head of the Aerospace Operations Analysis Section, Space Systems Division, in 1970.

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He was Chief of the Space Systems Division from 1972 until he became Director for Space. He was on special assignment as Acting Deputy Associate Administrator in the Office of Aeronautics and Space Technology at NASA Headquarters, Washington, D.C., for five months in 1977.

Holloway's research work has been in hypersonic aerodynamics, boundary layer transition and flow separation, analysis of entry flight mechanics and Earth orbital and planetary space missions. He has written about 40 technical publications in his fields of expertise. His early work in hypersonic aerothermodynamics, flight mechanics and mission analysis led to his 1969 appointment to the Space Shuttle Task Group.

He was later a consultant to the Shuttle Launch Site Review Board and a member of the Space Transportation System (STS) Technology Steering Committee, STS Payload Activities Committee and the Research & Technology Advisory Panel for Space Vehicles. He chaired the Shuttle Environmental Impact Panel on Sonic Boom and was administratively responsible for the Launch Vehicle Effluents Panel. He has been Langley's external spokesman since 1973 for Shuttle support, including thermal protection system, aerodynamics and flight-control system studies. He was instrumental in establishing NASA's Orbiter Experiments (OEX) Program, which uses Shuttle as a research vehicle.

As Director for Space at Langley, Holloway was responsible for advanced space transportation, planetary entry, Space Station, and large space antenna research, and for Langley's atmospheric science programs. He represented Langley on the NASA Space Station Technology Steering Committee, the Program Review Board of NASA's Space Station Task Force and the OAST Space Technology Assessment.

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He is an Associate Fellow of the American Institute of Aeronautics and Astronautics and is on the Board of Directors for the American Astronautical Society. He recently completed 8 years of editorial work for the AIAA Journal of Spacecraft and Rockets — 5 years as Associate Editor and 3 as Editor-in-Chief. As a member of the AIAA Publications Committee, he chairs the Advisory Board for the AIAA Educational Series, and he recently chaired the ad hoc task force of the future of the Journal of Spacecraft and Rockets.

He was selected for the Presidential Rank of Meritorious Service in 1981 for his sustained accomplishments in Federal service. He received a NASA Outstanding Leadership Medal in 1980 for "planning and directing research in support of Space Transportation Systems and Environmental Observation Programs, the result of which has served to greatly enhance the achievement of agency missions." He received a NASA Exceptional Service Medal in 1981 "in recognition of significant contributions leading to the conceptual design of the Space Shuttle, flight certification of the Thermal Protection System, establishment of the vehicle's aerodynamic characteristics, and characterization of the flight control system which enabled a successful first flight of the Space Shuttle."

Holloway and his wife, the former Barbara Jane Menetch, live in Poquoson; their son, Eric Scott, also lives in Poquoson.

- end -

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For Release:

December 19, 1984

RELEASE NO. 84-115

KINARD AWARDED HONORARY DOCTOR'S DEGREE

William H. Kinard of Williamsburg received an honorary doctor's degree from Clemson University December 20. Kinard is Chief Scientist, Long-Duration Exposure Facility Project, at NASA's Langley Research Center.

The honor was bestowed upon Kinard for his eminent achievements in basic scientific research related to the exploration of the solar system, and the great credit he has brought to his alma mater throughout his long career in the service of NASA and his country.

Kinard managed the initial design and development of the LDEF and the experiments. The LDEF is a free-flying structure on which 57 international scientific, applications and technology experiments are mounted. LDEF was placed in Earth orbit by the Space Shuttle in April 1984 for an 11-month exposure to the space environment.

Kinard began his NASA career in 1955 as an aerospace research intern. He became Head, Meteoroid Research Section in 1963 and Head, Space Effects Section, in 1971. He served as Head, Space Experiments Section, and Acting Head, Atmospheric Effects Section, from 1971 to 1974. He also served as LDEF Project Manager prior to his present assignment.

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He received his bachelor of science degree in mechanical engineering in 1954 from Clemson University.

The author of over 30 technical papers, Kinard holds five patents. He received a Langley Special Achievement Award for his work on the Pioneer 10/11 Meteoroid Detection Experiments. He also received a NASA Exceptional Scientific Achievement Award and a NASA Public Service Group Achievement Award, as a member of the Pioneer 10 Scientific Instrument Team. He received a NASA Group Achievement Award for his participation in the Pegasus Program, and a NASA Apollo Achievement Award.

Kinard and his wife, Rebecca, have two children, Kimberly and William.

- end -

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For Release:

Jean Drummond
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January 7, 1985

RELEASE NO. 85-1

VAN NESS RETIRES FROM NASA-LANGLEY RESEARCH CENTER

Harper E. "Jack" Van Ness, Head, Office of External Affairs at NASA's Langley Research Center, retired from government service January 3, 1985, after 45 years of government service.

Van Ness was responsible for Langley's external affairs program, including educational programs, community relations, public services, public affairs and congressional relations.

He began his NASA career at NASA Headquarters in Washington, D.C., in 1961 as Assistant Director for Manned Space Flight Operations, on loan from the U.S. Navy. After retirement from the Navy in 1969, he accepted a position at the Langley Research Center where he was assigned to the Viking Project Office until appointed to his present position in 1977.

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Van Ness received his high school diploma from Mexico High School, Mexico, Missouri. He received a bachelor of science degree in electrical engineering in 1942 from the U. S. Naval Academy. He also received a bachelor of science degree in aeronautical engineering in 1949 from the Naval Postgraduate School. He earned master of science degrees in mechanical engineering in 1950 from Rensselaer Polytechnic Institute and in business administration in 1967 from George Washington University.

He served in the U.S. Navy for 29 years with the majority of his assignments in research and development in guided missile and astronautics assignments. He also had destroyer duty and fighter squadron/carrier duty. He received the Navy Commendation Medal and the Navy Meritorious Service Medal.

Van Ness has received two NASA Exceptional Service medals, one for his work on the Viking Project and the other for "outstanding achievements in the promotion and public awareness of NASA's aeronautical research program."

He and his wife, Sue, live in Williamsburg, Va., and have three sons — Scott, John and Mike, one daughter-in-law, Jean, and one grandchild, Emma.

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For Release:

January 7, 1985

RELEASE NO. 85-2

EARL STAHL RETIRES FROM NASA-LANGLEY

Earl F. Stahl, Chief of the Operations Support Division at NASA's Langley Research Center, retired from government service January 3.

Stahl, division chief since 1968, directed technician services in operating Langley's research facilities, preparing test objects, such as models, and participating in experiments. He also directed the operation of the center's mechanical and electrical equipment, systems and utilities.

Stahl began his career in 1944 with NASA's predecessor agency, the National Advisory Committee for Aeronautics. During his career, he was an aircraft research facility operations technician, an operations supervisor and Head, Research Facilities Service Branch.

Before joining NASA, Stahl worked as a free-lance writer in Johnstown, Pa., a field representative for All-American Aviation (now U.S. Airline) and as a celestial navigation instructor with the U.S. Army Air Force..

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Stahl is the author of about 90 published magazine articles on model aircraft, sport aviation and amateur-built aircraft safety. He is also the co-author of a book on model aircraft and the contributor for over 15 years to World Book Encyclopedia. During the 1950s he was an instructor at the Langley Research Center Apprentice School.

In October 1980 Stahl was presented a NASA Exceptional Service Medal for "exceptional service and leadership in the management of technical support to the Langley research effort, assuring effective utilization of the center's diversified research facilities."

Stahl is married to the former Lillie Bateman. They have three children and live in Yorktown, Va.

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For Release:

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January 11, 1985

RELEASE NO. 85-3

ULTRASONICS, TOPIC OF JANUARY NASA-LANGLEY COLLOQUIUM

A subject that is becoming one of the more active areas in measurement science will be discussed at a Langley Research Center colloquium, Monday, January 21.

"Applications of Ultrasonics" will be presented by Dr. Gordon Kino, professor in the electrical engineering department, Stanford University, at 2 p.m. in the Activities Center, Building 1222. A press briefing will precede the lecture at 1:15 p.m.

One of the topics to be included in Kino's talk will be recent developments in acoustic microscopy. Instead of viewing the optical properties of a sample, these methods reveal internal structure and properties that have been invisible to examination, says Kino. In addition, methods of materials characterization will be presented that utilize unique analysis and propagation properties.

The presentation will have many visual aids that show the extraordinary advances that have been made in this field having impact on such diverse studies as electronics, materials science and medical diagnostics.

Kino is one of the nation's most respected scientists in the field of ultrasonics and has been responsible for advances in almost every area of the field from signal processing to nondestructive evaluation technologies.

He was awarded the Institute of Electrical and Electronics Engineers (IEEE) Distinguished Service Award, the 1984 IEEE Achievement Award and is a Fellow of the IEEE.

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For Release:

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January 24, 1985

RELEASE NO. 85-4

NASA-LANGLEY RESEARCH CENTER EMPLOYEE RECEIVES AWARD FOR AUTOMATING GOVERNMENT PERSONNEL FORM

A NASA Langley Research Center employee has received special recognition for automating a standard form, which has been approved by the Office of Personnel Management for use throughout the government.

Michael C. Garula, a Computer Systems Analyst in the Business Data Systems Division, has received a Langley Suggestion Award for the "mechanized preparation of SF52, Request for Personnel Action." This is the first time a Langley suggestion has been approved by OPM for use government-wide.

The $1,000 award and certificate were presented by Richard H. Petersen, Langley Director, in a special ceremony at Langley January 9.

Garula began working on the automation process in January 1982 when OPM implemented Federal Personnel Manual Supplement 296-33, Guide to Processing Personnel Actions. This required major changes to the computer programs that process the SF50, Notification of Personnel Action, which was automated in the early 1960's. While working with the Personnel Division to implement the necessary changes, Garula discovered that almost as much work was being done on the SF52 as on the SF50, yet there was no automated way of preparing the SF52.

The SF52 is a widely used government form, usually initiated by an employee's supervisor, and involves such personnel actions as requests for new positions, promotions and changes in jobs or duties. As a result of required personnel action, an employee receives a copy of the SF50, signifying that action has been taken.

- more -

After OPM confirmed that the form had not been automated, Garula received Personnel Division approval and support to begin the long and tedious process of designing the new form.

Garula visited Carol Porter, who is responsible for the preparation of the SF52, at OPM in Washington D.C. Porter's interest in the automation process prompted her to visit Langley in March 1983, where she recommended some changes to improve the SF52. "Her expertise was most welcome and a generous gift on her part," says Garula.

Upon final approval, the form was printed at Langley, since OPM does not assume responsibility for printing until yearly usage exceeds 100,000 copies.

The entire procedure took Garula almost two years to complete. "It was a tedious process, but now that the form is approved, other agencies will just look to us," says Garula. "If other agencies are interested in automating the SF52, all they have to do is call Langley because OPM is giving out our name freely. I send them samples of the form and then they can go through their own printing channels."

Since OPM announced approval of the SF52 for automated printing equipment, there have been inquiries from at least nine government agencies, including the Department of Transportation and Department of Labor, Washington, D.C.; the Department of the Navy, Gulfport, Miss; and the Federal Aviation Administration, Anchorage, Alaska. The Department of Labor was in a Reduction-In-Force effort when they called Langley, and had some 600 to 700 SF52s to type. With their personnel information already in a computer and with Garula sending them a supply of forms, they automated the process, saving many hours of manual work.

The Personnel Division estimates an annual savings of $10,000 at Langley alone by using the automated form, and Andrew G. Swanson, Chief of the Business Data Systems Division, said that a savings of at least $500,000 is expected nationwide. Garula said, "My primary interest was not for me. It was to help the labor intensity, as well as to get on record that NASA Langley had come up with it."

"To me, it was so amazing to think that something as obvious as this was never done before," Garula said. "If anything should be stressed in the Employee Suggestion Program, it is that an improvement or suggestion may not have necessarily been implemented. Employees should inquire about a suggestion rather than assume that it has been adopted."

Garula, of Hampton, has been a Langley employee for over 20 years. He began his career in the Financial Management Division (then the Fiscal Division). Within two years, he entered the data processing field, where he has worked ever since. He received a bachelor of science degree in business administration at George Washington University and a master of science degree in administration, also at GWU.

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For Release:
February 5, 1985

RELEASE NO. 85-5

LANGFORD ADDRESSES HUMAN POWERED FLIGHT AT NASA-LANGLEY COLLOQUIUM

John S. Langford, Massachusetts Institute of Technology, Cambridge, Mass., will be the guest lecturer at a NASA-Langley Research Center colloquium Monday, February 11.

"Human Powered Flight: The MIT Monarch" will be presented in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15.

The Monarch won first prize in the Kremer World Speed Competition May 11, 1984. An all-volunteer team designed and built the craft in 88 days during the summer of 1983, and the Monarch made 29 flights before it was disassembled and stored for the winter. During the spring of 1984, an improved version flew 35 times culminating in the record flight.

Langford's lecture will present design considerations and construction details behind the flight of the human-powered aircraft, Monarch, including propulsion and avionics.

- more -

Langford received a bachelor of science in aeronautics and astronautics in June 1979, a master of science degree in defense policy and arms control in May 1983, a master of science degree in aeronautics and astronautics in August 1984, all from MIT. He is a doctoral candidate in aeronautics and public policy, also at MIT.

Employed as an engineer by Lockheed-California Company since June 1979, Langford has conducted research in advanced development projects, X-Wing VTOL, systems analysis/operations and computer simulation models.

In addition to his work on the Monarch, he participated in the design, construction and flight testing of the human-powered aircraft, Chrysalis in 1979. He is the co-recipient of the Luis DeFlorez Prize for work on Chrysalis.

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For Release:

February 5, 1985

RELEASE NO. 85-6

STUDENTS TO COMPETE IN MATH CONTEST AT NASA-LANGLEY

Teams of seventh and eighth grade students from 16 area schools will compete in the Peninsula Chapter contest of the national MATHCOUNTS program February 16 at the Langley Research Center.

The day-long session will be held in the Langley Activities Center, Building 1222.

The contest has been organized by the Virginia Society of Professional Engineers. The MATHCOUNTS program is sponsored by the National Society of Professional Engineers, the National Council of Teachers of Mathematics, the CNA Insurance Companies, the National Science Foundation and NASA.

Schools participating in the contest are Carver, Dozier, Dunbar-Irwin, Hines, Huntington, Newsome Park and Reservoir Middle Schools in Newport News; Davis, Eaton, Lindsay and Syms Junior High Schools in Hampton; Queens Lake, Tabb and Yorktown Intermediate Schools in York County; James Blair Junior High School in James City County; and Our Lady of Mount Carmel in Newport News.

- more -

Teachers have been preparing the students for the competition since October. The students will be tested on probability, statistics, linear algebra and polynominals. The program consists of written tests and fast-paced oral matches. Winners will receive trophies and advance to the State MATHCOUNTS finals in Richmond April 20.

MATHCOUNTS is a nationwide program designed to answer the problem of declining math skills among students at the precollege level.

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For Release:

February 5, 1985

RELEASE NO. 85-7

COLE NAMED OPERATIONS SUPPORT CHIEF AT NASA-LANGLEY

Kenneth N. Cole has been selected as Chief, Operations Support Division, at the Langley Research Center. He replaces Earl F. Stahl, who retired January 3.

In this position Cole directs technician services in operating Langley's research facilities; preparing test objects, such as models; and participating in experiments. He also directs the operation of the center's mechanical and electrical equipment, systems and utilities.

Cole began his career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in 1948 as an apprentice electrician. From November 1962 to June 1966, he was a facilities support electrician supervisor and from June 1966 to July 1970, a supervisory electrical engineering technician, both in the Electrical Services Division. He was named Head of the Electrical Support Branch in the Operations Support Division in July 1970 and Head of the branch in March 1973.

In January 1981 Cole was named Assistant Chief of the Operations Support Division, where he assisted in managing the technician work force supporting center research facilities and laboratories.

Before coming to Langley, Cole served in the U.S. Army from 1946 to 1948.

Cole was born in Sanford, N.C. He graduated from Hampton High School in 1946 and the NACA Apprentice School in 1954.

He lives in Yorktown, Va., and has a son and a daughter.

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For Release:

February 5, 1985

RELEASE NO. 85-8

NASA-AMES MANAGER SELECTED AS NASA-LANGLEY DIRECTOR FOR SPACE

A top manager at the Ames Research Center, Moffett Field, Calif., has been selected as the new Director for Space at the Langley Research Center. The announcement was made recently by Langley Director Richard H. Petersen.

Robert R. "Skip" Nunamaker, Chief Engineer for Ames, will direct Langley's space research efforts. He will be responsible for advanced space transportation, planetary entry, Space Station and large space antenna research, and for Langley's atmospheric science programs.

Nunamaker has been with Ames since 1963. As Chief Engineer he worked in the fundamental aeronautical disciplines of computer sciences, human factors, flight simulators and testing in flight research, and in technologies for commercial and military rotorcraft, powered-lift and high performance aircraft; and in the fundamental space disciplines of life science, computer science, infrared astronomy, atmospheric science, entry aerothermodynamics and thermal protection systems.

- more -

Previously he was Chief of the Space Projects Division, responsible for the management and implementation of the new space projects assigned to the center. These included missions designed to investigate the origin of the stars in the universe using spaceborne infrared astronomy, to investigate the origin of the planets within our solar system by sending instrument-carrying probes into their atmospheres, and other smaller projects that use instruments carried into space to help man better understand the universe, the solar system and his own environment.

Prior to this assignment he was Deputy Project Manager and Mission Operations Manager of the much heralded Pioneer Project which registered many "firsts" in the nation's planetary exploration program. In these capacities he shared the overall technical and administrative management for the Pioneer Project which includes the successful ongoing solar-orbiting missions of Pioneers 6, 7, 8 and 9, the historical Pioneer 10 and 11 Jupiter/Saturn Missions, and the phenomenal Pioneer Venus Orbiter and Multiprobe Missions.

Nunamaker began his NASA career at the Lewis Research Center in 1958, where he acquired extensive space project experience with Project Mercury and space testing of electric rocket engines and cryogenic fluids.

From 1956 to 1958 he served in the U.S. Army.

Nunamaker received a bachelor of science degree in mechanical engineering from Georgia Institute of Technology in 1957 and did graduate study at Case Institute of Technology and University of California at Los Angeles. He attended the Federal Executive Institute in 1974.

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He has received many NASA awards for his work on the Pioneer Project, including two NASA Exceptional Service Medals. One medal was presented in 1980 for "his outstanding leadership as Study Team Manager and Deputy Manager for the Pioneer Venus Project," and the other in 1974 for "his outstanding performance as Mission Operations Manager for the Pioneer 10 Flight Mission."

In addition he was honored with the San Francisco Regional Emmy Award, National Space Club, Pioneer 10 Team, December 1973; Nelson P. Jackson Aerospace Award, National Space Club, Pioneer 10 Team, March 1974 and Pioneer Venus Team, March 1979; Columbus Gold Medal Award, Pioneer 10 Team, City of Padua, Italy, October 1977; Diploma of Honor by the Federation Aeronatique Internationale, Pioneer Venus Team, Nicosia, Cyprus, October 1979.

He is a member of the American Institute for Aeronautics and Astronautics and has been named to American Men and Women of Science, Who's Who in the West and Jane's Who's Who in Aviation and Aerospace: U.S. Edition.

Nunamaker lives in the Evergreen section of San Jose, Calif., with his wife, Linda, and family of two girls and two boys.

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For Release:

February 11, 1985

RELEASE NO. 85-9

NASA-Langley Sponsors Black History Program

Each February Black History Month commemorates the heritage of a people who were and are important to the development of the United States. It is a reminder of the nation's commitment to creating an environment wherein people of all races and colors can share the riches of this country.

From the earliest days of the settling of America, blacks have contributed to many scientific and engineering discoveries that have helped make life easier, safer and more pleasant for everyone.

NASA's Langley Research Center shares America's dedication to recognizing the contributions of black Americans and will host a special program in observance of Black History Month.

On February 22, Langley's Office of Equal Opportunity Programs will sponsor "Images, Heroes and Self-Perception," February 22 in the Activities Center, Building 1222, at 1 p.m.

Six students from Hampton University's Department of Speech Communication and Theatre Arts will perform selected prose and poetry readings which will emphasize the historical perspective of the plight of black Americans. Participating will be Reginald Freeman, David Barr III, Jamantha Williams, Anita McAllister, Keith Williams and Tracye Funn. They will be directed by Robert L. Hawkins.

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For Release:
February 25, 1985

RELEASE NO. 85-10

PHYSICS OF PIANOS AND VIOLINS, TOPIC OF NASA-LANGLEY COLLOQUIUM

Recent advances both in computer technology and in the theoretical understanding of the fundamental physics of musical instruments have made it possible to compute the exact shapes of sound waves which should be emitted by such instruments.

Dr. Gabriel Weinreich, Head, Musical Acoustics Group, Department of Physics, University of Michigan, will present a lecture on "Physics of Pianos and Violins" at a NASA-Langley colloquium Monday, March 11, in the Langley Activities Center, Building 1222. The lecture will begin at 2 p.m., preceded by a press briefing at 1:15.

According to Weinreich, the result of his research is of great interest to the musical acoustician because it provides a critical test of a given physical model. Weinreich will discuss and present through the audio system examples of piano and violin sounds synthesized in this way. In connection with the piano, new results showing the effects of finite mass of the piano hammer and of the coupling between pairs of piano

- more -

strings will be shown. In connection with the violin, the effects of nonlinear interaction between the bow and its string, and the frequency characteristics of the violin body will be especially emphasized.

Weinreich received his education at Columbia University and then became a member of the technical staff at Bell Telephone Laboratories. He moved to the University of Michigan and became a professor in 1964. He has made contributions in atomic beam spectroscopy, semiconductor electronics, and interaction of acoustic waves with electrons in semiconductors. In recent years he has concentrated on theoretical and experimental studies of musical instruments.

Weinreich is the author of three books on theory of solids, thermodynamics and physics and of numerous technical articles in the fields of acoustics and semiconductor physics. In 1979 his article "The Coupled Motion of Piano Strings" was published in "Scientific American."

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For Release:

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February 28, 1985

RELEASE NO. 85-11

CLARK TO RETIRE FROM NASA; WINGATE NAMED REPLACEMENT

Hubert K. Clark, Assistant Director for Systems Engineering and Operations at NASA's Langley Research Center, has announced plans to retire from government service. Dr. Robert T. Wingate, Chief of the Systems Engineering Division at Langley, will replace Clark, effective March 31.

As Assistant Director for SE&O since December 1979, Clark provides general direction to the overall technical operations and activities of the directorate consisting of 1,000 engineers and engineering technicians which provides highly specialized support service to Langley's research programs.

Wingate has been a division chief since November 1981. He provides technical and administrative direction of a highly diversified engineering organization having responsibility for advancing and applying engineering technology to the design, development and manufacture of aeronautical and space flight systems and ground-related facilities in the aerospace field.

- more -

Clark began his government career with NASA's predecessor agency, the National Advisory Committee for Aeronautics, in May 1952 as a mechanical engineer. In May 1962 he was appointed Head, Flight Systems Section. In July 1972 he was named Chief, Systems Engineering Division, where he administered and technically directed approximately 160 multi-discipline engineers and engineering technicians in the design, analysis, testing, integration and flight operations in support of Shuttle payloads, pollution measurement instruments, spacecraft, research aircraft models, full-scale aircraft systems and subsystems and analytical support to facility design.

He has served on numerous panels and committees at both the center and agency level and was chairman of the source selection board for the MAPS remote sensing instrument. He serves as chairman of all design reviews for Langley's major hardware developments.

During Langley's Viking Mission to Mars Project, Clark served on the technical advisory committee to the Project Manager and for the last few months prior to launch was temporarily assigned to the project to assist in obtaining timely completion of several subsystems and experiments critical to meeting a mandatory launch window.

In 1973 he led a Langley team that in three days designed, fabricated, tested and delivered to the launch site a deployable sunshield needed for emergency repair to the damaged Skylab thermal protection system. This allowed the countdown for the first crew launch to proceed thus preventing a mission abort.

Prior to joining the Langley staff, Clark was a power plant engineer in Goldsboro, N.C., and a mechanical engineer (design) with the Tennessee Valley Authority in Knoxville, Tenn. He served in the U.S. Navy from July 1943 to August 1946.

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Clark received a bachelor of science degree in mechanical engineering from Duke University.

He received a NASA Outstanding Leadership Medal in 1982; a NASA Exceptional Service Medal in 1976, 1977 and 1984; a Langley Special Achievement Award for contributions in 1976 and 1977; and several Group Achievement Awards. He received the agency nomination for Presidential Meritorious Executive in 1983 and 1984.

Clark and his wife, Georgia, live in Newport News, Va. They have two sons and a daughter.

Wingate began his NASA career in September 1959 as a mechanical equipment design engineer. He was named Head, Flight Dynamics Section, Flight Vehicles and Systems Division, in June 1968 and Head, Engineering Analysis Branch, Systems Engineering Division, in March 1971. In September 1979, he became Assistant Chief, Systems Engineering Division, helping manage the division responsible for the mechanical, electrical and systems engineering functions required to provide research facilities and flight hardware for aerospace research, applications and technology development programs. He became Acting Chief in August 1981.

Before joining the Langley staff, Wingate was an analytical design engineer at Pratt and Whitney Aircraft Company in West Palm Beach, Fla., from September 1958 to March 1959. He was an officer in the U.S. Army Signal Corps from March 1959 to September 1959.

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A native of Alabama, Wingate received a bachelor of science degree in mechanical engineering from Auburn University in 1958. He earned a master of science degree in mechanical engineering from the University of Virginia in 1964 and a doctorate in engineering mechanics from Virginia Polytechnic Institute and State University in 1971.

The author or co-author of 14 technical publications, Wingate has received several Group Achievement and Outstanding Performance Awards and a NASA Exceptional Engineering Achievement Medal.

Wingate and his wife, Audrey, lives in Hampton, Va., with their son and daughter.

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NASA News

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For Release:

H. Keith Henry

February 28, 1985

Release No. 85-12

NASA Langley Research Center Plans Open House

NASA Langley Research Center will observe the city of Hampton's 375th anniversary with an open house Saturday, April 27.

Visitors will have an opportunity to see the inside of several research facilities not normally open to the public. At each facility on the center tour, demonstrations and static displays will be supplemented by people prepared to answer questions about that facility's research.

Six wind tunnels of various size and description will be open, to include the National Transonic Facility, the first new wind tunnel to be built in the United States in many years. It is the first wind tunnel of its size to operate with supercold (-300 degrees F) nitrogen gas.

The tunnels are unique facilities for testing subscale models of aircraft and spacecraft. When in operation, their wind speeds range from a stiff breeze to many times the speed of sound.

At least one wind tunnel tour will include walking inside its cavernous tunnel shell to see its large drive fan. A much smaller, but extremely high-speed tunnel includes as part of its display a demonstration of computer-aided graphics for the design of space station and other space related concepts.

Other facilities open to the public will include the aircraft hangar where airplanes

- more -

and helicopters will be on display, aircraft cockpit simulators, the atmospheric sciences work area, acoustics and noise reduction facilities, the machine shop, and the structures and materials lab.

In the atmospheric sciences area, aircraft and space shuttle experiments will be on display. The acoustics presentation will include an aircraft flyover noise demonstration and a look at an advanced turboprop model in an anechoic (sound testing) chamber. In the machine shop, display topics include tech briefs, patent application and spin offs from space technology; and a numerical control machine will be cutting samples of space hardware which could be used for space station. The structures display offers a glimpse of construction concepts for various large space structures.

The Visitor Center and Activities Center will also be open to the public. The Visitor Center will have special programs relating to Hampton's 375th anniversary. The course of the sailing ship Godspeed, a replica to be sailed from England to Jamestown in the spring and summer of this year, will be charted in a special exhibit. In the Activities Center, films and special slide/lecture presentations will be featured.

It has been more than a decade since the public has been invited to visit research facilities at the center.

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EDITORS' NOTE: MORE DETAILS WILL BE SUPPLIED IN A PLANNED APRIL RELEASE.

NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

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For Release:
March 10, 1985

RELEASE NO. 85-13

LANGLEY TO HOST SPACE SHUTTLE STUDENT CONFERENCE

The 1985 Space Shuttle Student Involvement Project Regional Conference will be held at the Langley Research Center March 24 - 27.

The Shuttle Student Involvement Project is designed to stimulate student interest and participation in science and mathematics by providing the opportunity for students to submit experiment proposals for possible selection to fly on the Space Shuttle.

The regional conference, to be held in the Activities Center, Building 1222, will be attended by 20 winning semifinalists, accompanied by their teacher/advisors. During the conference, each student will present their experiment proposal orally. NASA consultants and university professors will be present to give suggestions and recommendations on how the students may improve their proposals.

After the regional conference, each student will resubmit their experiment proposals for national judging. If selected, the student's experiment will be developed into flight hardware and scheduled for future flight on board the Space Shuttle.

The subject areas for proposals include biology, astronomy and astrophysics, physics, medicine, earth science, chemistry, electronics, engineering and environmental and psychology/behavioral science.

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NASA News

National Aeronautics and
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Hampton, Virginia 23665
AC 804 865-2934

For Release:

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March 21, 1985

RELEASE NO. 85-15

HARRIS ELECTED VICE PRESIDENT OF AIAA

Roy V. Harris Jr., Chief of the High-Speed Aerodynamics Division at NASA's Langley Research Center, has been elected Vice President-Technical Activities for the American Institute for Aeronautics and Astronautics for the 1985-1987 term.

Harris will serve on the Board of Directors and will be Chairman of the Technical Activities Committee. Through these positions, he will work to improve the quality of all technical activities of the institute; strive to more effectively coordinate AIAA technical activities with publications, public policy, education and section activities; support AIAA participation in international exchanges and symposia; and advocate for policies that will bring the individual AIAA members, the local sections and the national organization closer together.

An Associate Fellow in the AIAA, he has been a member of the AIAA for over 26 years and active in its national and international technical activities for the past 14. He received the AIAA Lawrence Sperry Award for his work in the institute.

In recognition of his leadership of Langley research programs in turbulent drag reduction, supersonic and hypersonic aerodynamics and hypersonic propulsion, Harris was awarded a NASA Special Achievement Medal for Exceptional Service in 1968, a Langley

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Special Achievement Award in July 1982, and a NASA Medal for Outstanding Leadership in October 1982. He was selected as the Virginia Peninsula Engineer of the Year in February 1983 and received the Presidential Rank of Meritorious Executive in the Senior Executive Service of the U.S. Government in December 1984.

Harris lives in Newport News, Va.

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NASA News

National Aeronautics and
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Hampton, Virginia 23665
AC 804 865-2934

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(804) 865-3006

For Release:
March 21, 1985

RELEASE NO. 85-16

SAILBOAT DESIGN IDEAS TO BE DISCUSSED AT NASA-LANGLEY COLLOQUIUM

Sailboat designs that have proven to be the fastest over a 500 meter straight line course will be described by a Mathews boat designer at the April colloquium at NASA's Langley Research Center.

Chris White of Chris White Designs will present a videotape and slide presentation Monday, April 8, at 2 p.m. in the Activities Center, Building 1222. A press briefing will precede the lecture at 1:15 p.m.

White will use slides and videotapes to illustrate the sailing dragsters, which have set speed records as high as 36 knots. Some of the world's fastest boats are also the most unusual, using kites instead of sails, hydrofoils instead of hulls, according to White.

In his lecture, White will also discuss the construction of a boat he designed and built, "the Flying Proa," which uses lift generated by the sail to reduce hull wetted surface. He will show a videotape of the boat sailing and offer a brief performance analysis.

White launched his first trimaran at 19. He began construction of a 52-foot trimaran of his own design in 1979. His new boat, "Juniper," was launched in 1981.

Since 1982 White has been designing boats professionally. He specializes in offshore cruising boats but the challenge of designing the ultimate speed sailing boat has prompted the construction of two contenders for a new world speed sailing record. Plans are being made for a record attempt in September.

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NASA News

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Hampton, Virginia 23665
AC 804 865-2934

For Release:

Robin Hartigan
(804) 865-3006

April 3, 1985

RELEASE NO. 85-18

SCHRYER RECEIVES SUGGESTION AWARD FOR SAVINGS IN SUBSCRIPTION RATES FOR SCIENTIFIC JOURNALS

David R. Schryer, a research chemist at NASA's Langley Research Center, has been awarded $1250 for suggesting a way to save in subscription rates for scientific journals. Schryer recommended that all subscriptions purchased by Langley for use other than in the Technical Library be purchased in the name of the individuals who initiate purchase requests rather than in the name of NASA-Langley Research Center.

Schryer, of the Laser Systems and Measurement Branch, Flight Electronics Division, first discovered the vast difference between the institutional and individual rates of scientific journals in 1981 when he subscribed to "Atmospheric Environment." The institutional rate was $281, but the individual rate was $45. (The institutional rate for this same journal now exceeds $500.) After further investigation, Schryer discovered that thousands of research and development dollars were being spent to buy individual subcriptions at institutional rates.

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When Schryer proposed that the individual rate represents a savings of about 80 percent of the institutional rate, he received full support from Jane Hess, Head of the Technical Library Branch, to pursue his idea. "Jane was the first person to recognize that changing individual subscriptions from institutional to individual rates was a good idea and would result in significant savings," said Schryer. He discovered that subscribers can get journals at individual rates by simply transposing the first two lines of the mailing address. Instead of having a journal sent to the Langley Research Center to the attention of a subscriber, it can be addressed directly to an individual at Langley. The top line of the address determines whether the subscriber is an individual or an institution.

Schryer estimates a conservative annual savings of $30,000 to Langley with his suggestion. This policy is totally ethical since many publishers have a dual rate structure to encourage individual subscriptions, in addition to those purchased at institutional rates for library use. NASA's role in funding the subscriptions is readily apparent.

Schryer was awarded $350 in 1984 for his suggestion based on intangible benefits. When his suggestion was re-evaluated this year, however, he received an additional $900, based on a "reasonable estimate" ($30,000 annually) of tangible benefits to the government. Schryer was also awarded $50 by the Marshall Space Flight Center in 1984 for his suggestion, based on intangible benefits. The Lewis Research Center has also adopted the suggestion and will award Schryer approximately $140.

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When asked to comment on his success, Schryer said, "If you have a good idea, be persistent in pursuing it. Don't dismiss it because you think it's too simple."

Schryer, who received his award March 5 from William D. Mace, Director for Electronics, began his Langley career in 1957 as a research chemist in the Pilotless Aircraft Research Division. He received a bachelor's degree in chemistry from Catawba College in Salisbury, N.C., in 1954, and a master's degree in chemistry from the College of William and Mary in 1970. He has also completed additional graduate courses at the University of Virginia and the University of Maryland.

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NASA News

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Hampton, Virginia 23665
AC 804 865-2934

For Release:

Jean Drummond
(804) 865-3006

April 12, 1985

RELEASE NO. 85-19

DEVICE FOR TESTING SMALL-DIAMETER TUBES DEVELOPED AT NASA'S LANGLEY RESEARCH CENTER

An engineering technician at NASA's Langley Research Center has developed a device which permits accurate ultrasonic testing of small diameter polymeric tubes used in research programs.

Edward C. Taylor, of Langley's Fabrication Division, modified an existing system, called the Uresco Ultrasonic Immersion Testing System, with a holding device to allow testing of small graphite fiber reinforced epoxy specimens. Testing formerly had to be done by hand.

Taylor said that before he developed the device, curved or cylindrical shapes could not be tested with the Uresco system, which is designed to test only flat composite panels. Taylor modified the system, using stock material to manufacture the appropriate equipment, and then connected the apparatus to the base of the Uresco system.

The device Taylor invented rotates the tubes about their longitudinal axis while a high-frequency sound wave, transmitted through the tube wall, checks for flaws.

"The new method permits the nondestructive evaluation — testing without destroying — of tubular specimens on present equipment without altering the electronic or mechanical configuration of the system," Taylor explained. "It is unique in that we do

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not require a sophisticated turntable, but adapt the conventional ultrasonic test system to roll the cylindrical specimen so that the test can take place. An additional turntable mechanism would require a data gathering system modification along with the additional mechanical apparatus."

Graphite tubes are checked for defects, trapped gases, void spaces or foreign elements like a piece of metal. Defects are recorded on an oscilloscope and a photograph is taken to provide a permanent record of the defect. An engineer then must determine whether or not the tube will perform as one homogeneous material. If the defect is too great, the tube is discarded.

The device, in use at Langley since January 1983, was designed and built for $250; a commercial device designed to do the same job would have taken about eight months to buy and cost about $23,000. The new device, which can test tubes as long as 12 inches and up to four inches in diameter, permits accurate testing of a critical research item at a substantial savings of time and money.

Taylor, who has worked at Langley since September 1975 and is a graduate of the NASA apprentice program, was selected by the Langley Research Center Incentive Awards Committee to receive $500 for developing the device.

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NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

H. Keith Henry

For Release:

April 12, 1985

Release No. 85-20

NASA Open House Features Unique Facilities

More than a dozen unique research facilities will be featured when NASA's Langley Research Center honors the city of Hampton with an open house Saturday, April 27. Facilities will be open from 9 a.m. to 4 p.m.

Hampton is celebrating its 375th anniversary this year. Its slogan, "First from the sea, first to the stars," acknowledges Langley's contribution to this country's achievements in aeronautics and space. The mark of Langley research can be found on nearly every aircraft and spacecraft that the United States has ever flown.

Visitors can share in this history and take a glimpse into the future on open house day — the first opportunity in more than a decade to see the inner workings of several research facilities not normally open to the public. At each facility on the center tour, demonstrations and displays will be supplemented by people prepared to answer questions about that facility's research.

At the aircraft hangar, airplanes and helicopters will be on display. Included will be general aviation airplanes used in stall-spin flight testing, a delta-wing fighter which is purposely flown into thunderstorms to get struck by lightning, a transport modified for testing the latest in electronic cockpit controls and displays, and an Army-style airplane modified to test quieter and more efficient jet engine and nacelle concepts. Also at the hangar will be scale models of advanced aircraft — many radically different from today's configurations — representing commercial transport, military weapons systems, and

- more -

general aviation concepts.

In another location, aircraft cockpit simulators will be featured. The hydraulically-actuated "visual motion simulator" will be demonstrated, and a simulator for testing the handling qualities of fighter-type aircraft will be open for inspection. Visitors will also see an "advanced concepts simulator," which hints at the appearance of transport cockpits of the mid-1990's. Displays from the center's instrument research division will relate to flow visualization (for wind tunnels) and a speech synthesizer, among others.

In the atmospheric sciences area, aircraft and Shuttle-launched spacecraft experiments will be highlighted. Langley is a leading center of research into how man and nature affect the relatively thin, and sometimes fragile, atmosphere that blankets the earth.

At the center's aircraft noise reduction laboratory, different types and intensities of aircraft noise will be demonstrated. The sound of a typical helicopter, turbofan, and advanced turboprop airplane will be simulated in a facility designed to test public reaction to aircraft flyovers. Visitors will also see an advanced turboprop engine model installed in an anechoic (quiet) chamber. An acoustic test will be simulated.

One of the highlights in the machine shop/fabrication area is the cutting of space hardware samples which may someday be used for space station. A numerical control machine will machine the parts, which visitors will have the opportunity to handle. A series of manned displays will present the work of each branch of the fabrication division. Topics will include "tech briefs," patent application and spins offs from space technology. A separate display manned by the personnel division will provide information on the center's apprenticeship program.

In the materials and structures lab, displays will offer a glimpse of construction concepts for various large space systems, like space station and other candidates for earth orbit. Materials and materials-processing concepts for advanced aircraft and spacecraft will also be on display. Graphite fiber composites and experimental metallic alloys are tested in this lab. Films highlight the lab's "million pound machine" in a test of composite material strength and astronauts constructing a 36-element truss in a simulated weightless environment.

Six wind tunnels of various size and description will be open. The tunnels are unique facilities for testing subscale models of aircraft and spacecraft. When in operation, their wind speeds range from a stiff breeze to many times the speed of sound.

One tunnel on the tour, the National Transonic Facility, is the first new wind tunnel to be built in the United States in more than 10 years. It is the first wind tunnel of its size to operate with supercold (-300 degrees F) nitrogen gas. Visitors will get within a few feet of a scale model mounted in the test section, walk through the facility's impressive control room and, in the model assembly bay, get a close-up view of a model being prepared for test.

At least one wind tunnel tour will include walking inside its cavernous tunnel shell to see its large drive fan. The 4- By 7-Meter Tunnel will also have various wind tunnel models on display. This subsonic tunnel routinely tests new aircraft concepts ranging from helicopters to fighters to advanced transports.

In one building, visitors are offered an extensive look at two high-speed wind tunnels. The 31" Mach 10 Tunnel will feature a model display and tour through the test section and control room. In the test section, a computerized model injection/attitude control system will be demonstrated. In the larger Unitary Tunnel, visitors will see a display in the shop area of tunnel models with instrumentation. Another high-speed model will be mounted in the test section. For those who can navigate a few steep and grated steps, an optional part of the tour includes an escorted side trip to the tunnel control panel and main drive area.

The Eight-Foot High Temperature Tunnel is also on the tour. This one-million-horsepower methane "blowtorch" is used for the realistic testing of flight structures under the stresses and high temperatures of hypersonic flight. Before the Space Shuttle flew, some of its thermal insulation tiles were tested here.

A much smaller, but very high-speed tunnel is the Helium Tunnel, recognized by the giant spheres that have become a Langley landmark. Demonstrations, displays and videos will tell the story of Mach 20 testing of Shuttle for atmospheric reentry, of spaceplanes and other extremely high-speed vehicles.

A space station computer aided design simulation will share display space in the Helium Tunnel. Space station configurations are illustrated and a display will show drawing-to-model creation of a space station. A simulated computer aided design facility, made up of several computer graphics terminals with dynamic displays, will depict design and analysis of space station concepts.

In the Langley Activities Center, films and a special slide/lecture presentation about Langley will be featured. Films will include "NASA Highlights," "To Fly," "Space Station, the Next Logical Step," and "Flyers." A film or presentation will begin every half hour beginning at 9 a.m.

Three new Langley Visitor Center exhibits will be unveiled to the public for the first time at open house. They are: Voyage of the Godspeed: NASA's Role; NASA Launch Schedule; and a photographic history of Langley from 1917 to the present. The course of the sailing ship Godspeed, scheduled to depart April 30 from England for Virginia in a re-creation of the original 1607 voyage, will be charted as part of the Godspeed exhibit. Because of the open house, the Visitor Center will open at 9 a.m. on April 27 and close at 4:30 p.m.

Ample free parking and on-Center bus transportation will be provided, with special bus service for the handicapped.

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NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

April 12, 1985

H. Keith Henry

Release No. 85-20, Part 2
(Public Service Announcement)

NASA OPEN HOUSE: 30 SECONDS

On Saturday, April 27th, NASA Langley Research Center will honor the city of Hampton with an open house. The Tidewater city is marking its 375th anniversary this year. NASA Langley has been a part of Hampton's history since World War I. Open house visitors will see the inside of several research facilities not normally open to the public. The latest aircraft and spacecraft concepts are conceived and tested here — in cavernous wind tunnels and other facilities. NASA Langley will be open from 9:00 A-M to 4:00 P-M the day of the open house.

NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

H. Keith Henry

Release No. 85-21

For Release:

April 18, 1985

EDITOR'S NOTE REFERENCE NASA OPEN HOUSE

Here's an administrative note or two that may help news media planning to attend/cover Langley Research Center's open house:

The open house will be from 9 a.m. to 4 p.m., Saturday, April 27.

Displays will pretty much be in place the day before, on Friday, April 26, for those who want to do a story the night before. Let us know if you are interested. For instance, we could probably line up an interview with one of the people who will be explaining their facility/research to the public the next day.

On open house day, with the enclosed car pass, you can enter the center through our back gate off Wythe Creek Road, avoiding the crush of traffic. Theoretically, a car pass will not be necessary for a "marked" media car, but having the pass may help smooth your way.

Please restrict your driving to areas designated for the open house and use common sense in parking. There will be a few spaces at the hangar building main entrance and the activities building reserved for news media. Failing that, the lot opposite the activities building (bldg. 1222, where our visiting speakers talk) should have space available and is a good central location for the open house. The public will be walking and riding center buses, which of course will be available to you, too.

A handout that includes an open house key to exhibits and map will be available at the activities center, the hanger building, the cafeteria (when open), from bus guides and

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at tour stops.

A news media information center will be staffed throughout the open house in the Langley Room of the activities building. We will transfer our regular Office of Public Affairs telephone line to the information center so we can be reached — as usual — at 865-2934.

We are not attempting to badge media representatives.

Have a good time. Let us know if we can help.

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NASA News

National Aeronautics and
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Langley Research Center
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AC 804 865-2934

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For Release:

April 17, 1985

RELEASE NO. 85-22

NASA-LANGLEY TO DISPLAY SHUTTLE EXPERIMENT

The flight hardware for a NASA-Langley Research Center payload, scheduled to fly aboard the Space Shuttle in December 1985, will be on display in Langley's Building 1250 Wednesday, April 24. News people are invited to see the assembled experiment and to talk to the principal investigator from 10:30 to 11:30 a.m.

The flight experiment, called the Assembly Concept for Construction of Erectable Space Structures (ACCESS), is a two-man assembly procedure for erecting large beam-like trusses in space during astronaut extravehicular activity (EVA). The experiment will provide NASA with the first authentic insight into man's ability to assemble structures in the space environment, using the workstation concept.

ACCESS, a simple and inexpensive first-generation space construction experiment, will use the Shuttle Orbiter as a construction base and will provide data for future space station construction concepts.

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Color videotapes of the actual flight hardware in Building 1250 and of the training hardware during underwater testing at NASA's Marshall Space Flight Center will be available at the briefing.

The principal investigator for the experiment is Walter L. Heard Jr.

To locate Building 1250, go past the NASA main gate on Ames Road for six blocks to the last building on the left. Once inside the building, a representative from the Public Affairs Office will escort you to the high bay area.

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NASA News

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AC 804 865-2934

For Release:

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April 19, 1985

RELEASE NO. 85-23

BERRY SELECTED ASSISTANT DIVISION CHIEF AT NASA'S LANGLEY RESEARCH CENTER

Calvin C. Berry, former Head, Tunnels Operations Branch at the Langley Research Center, has been named Assistant Chief of the Operations Support Division.

In this position, Berry assists in the planning, developing, directing and evaluating technical support in the operation, maintenance and modification of research test facilities and associated systems and equipment at Langley.

Berry began his Langley career in September 1949 as an apprentice electrician. He graduated from the Langley Apprentice School in 1954 and worked as an engineering technician in the Electrical Systems Division until he was named Head, Research Operations Electrical Section, OSD, in 1969. In 1972 he became Head, Technical Support Section D and in 1977 Head, Tunnels Operations Branch.

A native of Virginia, Berry graduated from Hampton High School. He served in the U.S. Army from 1944 to 1946.

Berry lives in Yorktown with his wife, Thelma, and son, Tim.

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NASA News

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Hampton, Virginia 23665
AC 804 865-2934

For Release:

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April 25, 1985

RELEASE NO. 85-24

NASA-LANGLEY HONORS INVENTORS AT LUNCHEON

Forty-four NASA Langley Research Center inventors who received United States patents in 1984 and recipients of Langley's Technology Transfer awards, will be honored at the annual Inventors' Luncheon Wednesday, May 1, at the Langley Air Force Officers' Club.

Richard H. Petersen, Langley Director, will present the awards and will be the guest speaker for the occasion.

Langley employees are recognized annually for inventions which have been determined to be of significant value in the advancement of the aerospace technology program of NASA.

Inventors receiving awards are Ja H. Lee, Frank Hohl (posthumously), Willard R. Weaver, William T. Davis, Adolphus B. Blair Jr., Thomas C. Moore, E. Leon Morrisette, Dennis M. Bushnell, Carlton W. Mann, Paul M. Hergenrother;

Terry L. St. Clair (four awards), Harold D. Burks, David A. Yamaki, Robert L. Fox, Allan W. Frizzell, Bruce D. Little, Donald J. Progar, Robert H. Coultrip, Richard H. Couch, John R. Gleason, Bland A. Stein, John D. Buckley;

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Charles E. Byvik, Moses G. Farmer, Allan J. Zuckerwar (two awards), David D. Kershner, Charles J. Camarda, Lana M. Couch, Robert M. Baucom, Jag J. Singh, H. Douglas Garner, William E. Howell, Ian O. MacConochie, Ashby G. Lawson, H. Neale Kelly;

Dwight G. McSmith (retired), James I. Richardson, Gene J. Bingham (Army), Randall C. Davis, L. Robert Jackson, Thomas T. Bales, Dick M. Royster, Diane M. Stoakley and Anne T. St. Clair.

Technology Transfer awards will be presented to Dr. Joseph S. Heyman and to the Materials Division. The citation accompanying Heyman's award reads, "for outstanding achievement in the transfer of the technology of ultrasound to applications in the biomedical and industrial sectors."

The division's award, which will be accepted by Dr. Darrel R. Tenney and Louis A. Teichman, is given for "superior performance in facilitating the transfer and use of materials technology in public and private sector applications."

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AC 804 865-2934

For Release:

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April 30, 1985

RELEASE NO. 85-25

SMALL BUSINESS IS "BIG" BUSINESS FOR NASA-LANGLEY

President Reagan has proclaimed the week of May 5-11 as Small Business Week to honor the small business owners of our nation and NASA's Langley Research Center is helping celebrate.

For FY 1985, Langley's goals for contract awards to small businesses, minority/disadvantaged firms and women-owned firms are \$82.5 million, \$8 million and \$4.25 million respectively.

Small business firms are doing many jobs at Langley, including building and ground maintenance, warehousing, transportation, security, custodial service, data management and research and development.

It is NASA policy to place a fair proportion of its total purchases and contracts for supplies, research and development and services with small business concerns. Each year, NASA Headquarters in Washington, D.C., sets socioeconomic program goals for contract awards at each center.

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NASA News

National Aeronautics and
Space Administration

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AC 804 865-2934

For Release:

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May 1, 1985

RELEASE NO. 85-26

SWANSON RECEIVES FLOYD THOMPSON FELLOWSHIP AT NASA-LANGLEY

Dr. Roy C. Swanson Jr., an aerospace technologist in the Transonic Aerondynamics Division at NASA's Langley Research Center, has been awarded the Floyd L. Thompson Fellowship for 1985-86 to study at Brown University in Providence, Rhode Island.

The Thompson Fellowship Program was established in 1977 to encourage the development of research potential among the Langley staff. The fellowship allows researchers who have demonstrated continued growth in research to spend up to 12 months at an educational or research institution. It is named in memory of Dr. Floyd L. Thompson, Langley Director from 1960 to 1968.

At Brown, Swanson will conduct research on numerical schemes for the three-dimensional Navier-Stokes equations, under the direction of Professor David Gottlieb, an internationally-known mathematician. Gottlieb, who will be on leave of absence from Tel Aviv University in Israel for the academic year, has conducted research in the principal features of the most widely used schemes (both explicit and implicit) for solving mixed hyperbolic-parabolic systems of partial differential equations, such as Navier-Stokes equations.

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"The principal objective of my research is to investigate the numerical properties of existing and proposed schemes for solving the time-dependent, 3-D Navier-Stokes equations," Swanson explained. "Both the numerical and computational efficiency of these schemes will be evaluated. Then, efforts will be made to construct more efficient algorithms for solving the Navier-Stokes equations for flow over aerodynamic configurations."

In previous work, Swanson has investigated and applied both explicit and implicit numerical methods to the Navier-Stokes equations, both full and thin layer. At the present time, he is investigating multistage time-stepping schemes combined with acceleration techniques, such as residual smoothing, for solving viscous flows.

"In the Theoretical Aerodynamics Branch, we are also working with 3-D multistage time-stepping schemes," Swanson said. "Therefore, I believe that a year of uninterrupted research on mathematical and numerical analysis of existing and potential schemes for 3-D viscous flows with Professor Gottlieb, will significantly enhance the rate of progress in TAB in constructing an efficient solver for high Reynolds number aerodynamic flows. Also, I believe that the cooperative effort between the TAB, the Computational Methods Branch, and the Analytical Methods Branch to develop a prediction code for 3-D flows based on an upwind scheme with relaxation, would benefit from the proposed research."

Swanson, a Langley researcher since 1977, said there are potential benefits for NASA-Langley in many areas of aerodynamic research that would result from accelerating the development of a practical Navier-Stokes code for 3-D flows.

A native of Baltimore, Md., Swanson received bachelor and master of science degrees and a doctorate in aerospace engineering from Virginia Polytechnic Institute in 1969, 1971 and 1974, respectively.

Swanson, his wife, Clara, and their son, Joe, live in Newport News.

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NASA News

National Aeronautics and
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For Release:

Jean Drummond
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May 3, 1985

RELEASE NO. 85-27

KIRBY ATTENDS SENIOR EXECUTIVE SEMINAR AT CARNEGIE-MELLON

Dr. Cecil E. Kirby, Assistant Chief, Facilities Engineering Division, at NASA's Langley Research Center, will attend the Senior Executive Seminar at Carnegie-Mellon University, Pittsburgh, May 19 through June 7.

The seminar is an intensive graduate-level program for a select group of men and women in policy-making positions in the government, corporations and other organizations concerned with the interaction between the public and private sectors.

Kirby, who was selected for the seminar in a NASA-wide competition, said he hopes "to broaden management perspective and develop greater awareness of interactions with other agencies and organizations."

The three weeks at the School of Urban and Public Affairs involves the participants in an integrated sequence of classes, practical work and discussions of key issues in political economy, management sciences and other disciplines relevant to policy-making and administration in large organizations.

Kirby said relating his experience in a high technology, multi-project environment will be his primary contribution to the program and to other participants. He previously

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has attended the NASA Middle Management Program and Brookings Institution Management of High Technology Programs Federal Seminar, Oak Ridge on Public Policy Issues.

In his position at Langley, Kirby supervises technical planning and engineering design, construction and testing of aerospace ground research facilities, such as wind tunnels, flight simulators, engine test stands and materials testing systems.

Kirby joined the Langley Research Center in 1963 as an aerospace engineer and has held a variety of positions including project engineer for spacecraft controls and propulsion systems; project manager for solar, wind and trash-burning energy systems; Assistant Head, Flight Vehicles and Mechanical Systems Section; Head, Facilities Systems Section; and Head, Systems Design Branch. In addition to his work at Langley, he served a one-year assignment at NASA Headquarters in Washington, D.C.

Prior to joining NASA, he served in the U.S. Air Force and was a design engineer for a mechanical contractor in Sumter, S.C.

A native of South Carolina, Kirby received a bachelor of science degree in electrical engineering from Clemson University in 1955 and a master of science degree and a doctorate in mechanical engineering from the University of South Carolina in 1963 and 1969, repsectively.

Kirby, a registered professional engineer in Virginia, is a member of the American Institute of Aeronautics and Astronautics and the American Society of Mechanical Engineers.

Kirby, his wife, Jane, and their three sons live in Hampton, Va.

- end -

NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

H. Keith Henry
(804) 865-2934

May 17, 1985

RELEASE NO. 85-29

LARGE SPACE ANTENNA FLEXES WINGS IN GROUND TEST

The first successful ground deployment of a 50-foot antenna system marks a milestone in NASA's program to demonstrate that large space antenna concepts are feasible.

The test, recently conducted for NASA by the Harris Corp., Melbourne, Fla., demonstrated that the hoop-column antenna concept will unfold — umbrella-style — from a compact package to a graceful combination of thin structural members, quartz filament cords and gold-plated mesh.

The mesh serves as a precision reflecting surface stretching across the diameter of the supporting "hoop." The mesh surface is shaped like a dish, but could be designed to be flat, spherical or conical, depending on the intended application. The antenna column is an equally precise, telescoping hub, forming the central structure of the antenna, tensing the cords that shape the antenna surface and housing the electronic feed mechanism.

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The tremendous size of potential large space antennas means a significant boost in effective radiated power from space and an increased sensitivity to weak signals from the ground or from other points in space. One potential application is in communications. Presently, a large antenna must be placed at each Earth station to receive the weak signals transmitted through small antennas on satellites. By placing the large antennas in space, the size and cost of the antennas required at each ground site will be greatly reduced. A few super-antennas placed in high geosynchronous orbit could cover the globe, instead of the great number of smaller satellites that would otherwise be required.

Millions of inexpensive home rooftop or land mobile unit antennas could receive satellite signals now picked up by only a few very large ground stations.

NASA believes the 50-ft. antenna system is the largest precision antenna designed for space that can be accommodated in existing ground electromagnetic test facilities. A series of additional tests are planned using this system as a benchmark.

Thomas G. Campbell, a researcher at NASA's Langley Research Center, Hampton, Va., puts the test into perspective: "Now we've proven that the hoop-column concept will mechanically deploy from a small, Shuttle-compatible package into a strong but lightweight structure providing a large precision reflector surface. It looks good. The next phase of the test program is aimed at confirming the radio frequency performance of the system. For that, we've gone to Martin Marietta Corp., Denver."

The ultimate deployable space antenna may have diameters as large as 150 to 300 ft. or as long as a football field. Studies show that larger concepts will have to be assembled in space.

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Even at 50 ft., points out Dr. Earle K. Huckins, former head of Langley's Large Space Antenna Systems Technology Office, the test antenna represents a quantum jump in performance compared to the largest space antennas used today for civil applications. The experimental Applications Technology Satellite (ATS-6), launched by NASA in 1974, used a 30-ft. antenna to relay TV and other signals to a variety of receivers in previously isolated areas around the globe. A more precise antenna surface and a modest increase in size makes the test antenna many times more powerful and a candidate for use on the Space Station.

NASA research in a broad range of disciplines — including materials, packaging and control of large flexible structures —has advanced the technology required for development of large space antennas and, says Huckins, has significantly reduced the economic risks for industrial application.

- end -

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NASA News

National Aeronautics and
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Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

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May 24, 1985

RELEASE NO. 85-31

MURACA IS NAMED CHIEF, SYSTEMS ENGINEERING DIVISION AT NASA'S LANGLEY RESEARCH CENTER

Dr. Ralph J. Muraca, Deputy Manager of the Space Station Program Office, has been named Chief of the Systems Engineering Division at NASA's Langley Research Center. He will continue his role in the Space Station Office until his replacement is selected.

As Chief, Muraca will provide technical and administrative direction to a highly diversified engineering organization having responsibility for advancing and applying engineering technology to the design, development and manufacture of aeronautical and space flight systems and ground-related facilities in the aerospace field.

During his career at Langley, which began in February 1962 as an aerospace engineer, Muraca has worked in the Systems Engineering Division as Head, Fluid Analysis Section; in the Aircraft Energy Efficiency Project Office as Deputy Project Manager for Laminar Flow Control; as Technical Manager, Shuttle Tile Life Assessment Team; and as Assistant Chief, Systems Engineering Division. He has specialized in structural dynamics and fluid mechanics.

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Muraca received a bachelor of science degree in mechanical engineering from Drexel Institute of Technology, a master of science degree in aerospace engineering from the University of Virginia and a doctorate in aerospace engineering from Virginia Polytechnic Institute and State University.

The author or co-author of several technical publications and presentations, Muraca has received several NASA awards, including a Project Group Award, five Special Achievement Awards, two Outstanding Performance Awards and a NASA Exceptional Service Medal. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

Muraca, and his wife, Sandra, live in Poquoson. He has three sons and two daughters.

- end -

NASA News

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AC 804 865-2934

For Release:

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(804) 865-3006

May 29, 1985

RELEASE NO. 85-32

JOPLIN ACCEPTS MIT'S SLOAN FELLOWSHIP

Sammie D. Joplin, Head, Facility Systems Branch, Facilities Engineering Division, at NASA's Langley Research Center, has been accepted by the Massachusetts Institute of Technology as an Alfred P. Sloan Fellow for 12 months, beginning June 14, 1985.

Joplin is one of 55 mid-career executives from the United States and abroad selected for the course of study leading to a master of science degree in management at MIT's Alfred P. Sloan School of Management.

This will be the 54th year of the program, the first executive education program in the United States. "The original concept of broadening and developing outstanding but typically specialized mid-career executives for more general and senior management responsibilities in the future still guides the direction of the program," Director Alan F. White said. "Graduates of the program have risen to significant leadership positions in their organizations throughout the world." White said there are now over 1,500 alumni of the program.

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"As a Sloan Fellow at MIT, my objective is to gain the knowledge and experience needed to be effective in the management of future NASA assignments and to help NASA achieve its goals in aeronautics and space," Joplin said.

He explained that over the last 10 to 15 years his contribution has been primarily of a technical nature, either the design of a rocket payload, an aircraft or a research facility. He has transitioned from the detail designer to the manager of highly educated and talented engineers involved in the design of facilities and equipment used in aeronautical research.

"It is challenging to be part of the organization that will provide the research capability for one of the best aeronautical research centers in the world," Joplin explained. "It would be a great inconsistency to train the best engineering talent available and not provide the best managers to use that talent to achieve NASA's goals. Management, like engineering, is a life-long commitment to practice and study to keep up with advancements in the field. I have set my priorities on management. If I am to make a significant contribution in the future, it will be in the management area."

As Head, Facility Systems Branch, Joplin manages and directs the branch responsible for the design, construction and initial operation of research facilities at Langley in areas of mechanical design, fluid mechanics, heat transfer, hydraulic controls, cryogenics, vacuum, and high pressure/temperature systems.

Joplin joined the Langley Research Center in February 1963 as an aerospace technologist. He has held various research positions, such as technical project engineer on the Hypersonic Research Aircraft Project; airframe manager and deputy project manager, Rotor Systems Research Aircraft Project; and Head, Mechanical Engineering Section.

A native of Mississippi, Joplin received a bachelor of science degree in mechanical engineering from Mississippi State University in 1963 and a master of science in administration from George Washington University in 1971.

Joplin, his wife, Gayle, and their two daughters live in Hampton, Va.

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AC 804 865-2934

For Release:

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June 10, 1985

RELEASE NO. 85-33

CLINE SELECTED CHIEF OF PERSONNEL DIVISION AT NASA-LANGLEY

Mary R. Cline has been selected as Chief of the Personnel Division at NASA'S Langley Research Center.

In this position she administers personnel management activities and services, such as staffing and recruitment, classification and position management, incentive awards and employee recognition, personnel evaluations, labor-management relations, training and educational services, employee occupational health and service benefits, and manpower analysis and personnel reporting systems.

Cline began her NASA career in November 1979 as a Personnel Management Specialist and since has held several management positions, including Assistant Chief, Research Information and Applications Division; Assistant to the Chief, Personnel Division; and Head, Placement and Position Management Branch.

Before coming to Langley, Cline held various personnel assignments with the Department of the Navy and the Department of the Army, to include Personnel Staffing Specialist, Headquarters TRADOC, Fort Monroe, Va.; Personnel Officer, Fort Monroe;

- more -

Head, Classification Branch, Presidio of Monterey, Calif.; and Chief, Western Area Recruiting Office, Presidio of San Francisco.

A native of Indiana, Cline received a bachelor of arts degree in political science from Purdue University in 1965 and attended Indiana University School of Law in 1965-66. She earned a master of arts degree in personnel management from George Washington University in 1980.

Cline is a member of the Hampton Roads Classification and Compensation Society. She received Langley Certificates of Achievement in 1972 and 1975 and Special Achievement Awards in 1978, 1979 and 1984.

Cline and her husband, John, live in Poquoson, Va.

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AC 804 865-2934

For Release:

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June 10, 1985

RELEASE NO. 85-34

NASA-LANGLEY DIRECTOR TO CHAIR CONFERENCE ON INTERNATIONAL AIR TRANSPORTATION

Air transportation, from federal regulation and airport terminal planning and design, to commuter and transport aircraft and public attitudes toward community noise, will be featured at a conference later this month in Norfolk, Va.

Langley Director Richard H. Petersen will chair the International Air Transportation Conference June 26-28 at the Omni Hotel and will also give the welcome address on the opening day.

Sponsored by the American Institute of Aeronautics and Astronautics, American Society of Civil Engineers, Transportation Research Board and the Canadian Aeronautics and Space Institute, the conference will be attended by representatives from universities and private industry throughout the United States and Canada, the Federal Aviation Administration and NASA.

During the three-day conference, sessions have been planned on transportation and the changing environment, aircraft noise, airport capacity, environmental aspects, airport capacity developments since deregulation, NASA Aircraft Energy Efficiency Program update, modernizing infrastructure for airports, commuter aircraft, air traffic

- more -

patterns and operations changes since deregulation, perspectives of the new air cargo environment, operations and maintenance economics, and the national airspace system plan. Workshops will be offered Wednesday on community involvement and airport capacity issues.

Howard T. Wright, Langley Director for Projects, is chairman of the ACEE session. Langley employees making oral presentations at the conference are Ray V. Hood, "A Summary of the Energy Efficient Transport Program Results;" Herman L. Bohon, "Development of Composites Technology for Transport Aircraft;" Richard D. Wagner, "Development of Laminar Flow Technology for Transport Aircraft;" and Robert W. Koenig, "NASA Technology for Advanced Commuter Aircraft."

Thursday's activities include a tour of Langley's research facilities for conference attendees, followed by a seafood feast at the Langley Activities Center conference attendees and spouses.

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NASA News

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AC 804 865-2934

For Release:

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June 19, 1985

RELEASE NO. 85-35

NASA-LANGLEY HOSTS GOVERNOR'S SCHOOL FOR THE GIFTED

Twenty-six Virginia high school students will spend six weeks at the Langley Research Center this summer performing "real life" science and engineering tasks under the direction and guidance of NASA mentors.

Beginning June 24, 17 boys and nine girls will participate in the Governor's School for the Gifted. These students possess a high level of ability in mathematics and science and have demonstrated outstanding achievement in these areas.

Approximately 700 students from across the state are nominated for the Governor's School programs hosted at various state colleges and universities. From the 700 nominees, 450 are selected to participate in the summer experience, 125 of them assigned to the program hosted by Langley. Selections are based on grade point average, extracurricular activities, teacher recommendations and a written paper.

This is the fourth summer Langley has served as a host to the Governor's School, sponsored by the Virginia Department of Education. The NASA program is based on a mentor-model. Each student is selected by a NASA scientist or engineer and works under the direction and guidance of that individual. One of the objectives of the program is to

- more -

offer "real life" career exploration to bright students who are considering careers in science or engineering. During the six weeks, the students are housed on the campus of Hampton Institute and participate in appropriate evening and weekend activities.

The NASA mentors are the key to the success of the program. They are volunteers who have participated in orientation sessions relating to the personality characteristics and psychological needs of gifted high school students. Each mentor serves as a role model for the students and has a tremendous impact upon the future of his or her protege.

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NASA News

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AC 804 865-2934

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June 25, 1985

RELEASE NO. 85-36

NASA-LANGLEY MANAGER TO ATTEND HARVARD'S PROGRAM FOR SENIOR MANAGERS IN GOVERNMENT

Dr. Michael F. Card, Chief of the Structures and Dynamics Division at NASA's Langley Research Center, has been selected to attend Harvard University's Program for Senior Managers in Government, beginning July 28.

The three-week executive education program for experienced senior executives in the public and private sectors is aimed at those top executives who combine substantial professional achievement with the potential for further contribution to their organizations. The curriculum focuses on building strength in several key management areas: organizational strategy, policy analysis and design, political management, management control and operations, and management of human resources.

As a Langley manager, Card is responsible for the division that does research in structural dynamics, structural concepts and structural mechanics.

Card, who joined the Langley staff in 1958, was appointed Head, Structural Evaluation Section in 1970. He was selected by the President's Commission on Personnel Interchange in 1972 as one of three NASA employees to participate in the Executive

- more -

Interchange Program. While in the one-year program, he worked at TRW Systems. He became Head of the Structural Mechanics Branch in 1974 and Head of the Structural Dynamics Branch in 1979.

The author or co-author of over 30 papers on structural mechanics of metallic and composite plate and shell structures, Card is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

Born in Seattle, Wash., Card received a bachelor of science degree in aerospace engineering from the Massachusetts Institute of Technology in 1958. He earned master of science and doctor of philosophy degrees in engineering mechanics from Virginia Polytechnic Institute and State University in 1964 and 1970, respectively.

Card and his wife, JoAnn, live in Williamsburg. They have three children.

- end -

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AC 804 865-2934

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For Release:

June 25, 1985

RELEASE NO. 85-37

NASA-LANGLEY TO HOST SPACE COMMERCIALIZATION SYMPOSIUM

One of NASA's major goals is to "expand opportunities for United States private sector investment in space-related activities." NASA's Langley Research Center is sponsoring a symposium July 18 on "space commercialization" to identify joint venture possibilities with NASA.

During the symposium experts from NASA and private business will address specific topics regarding enhanced space technology, experimentation and product development. Langley researchers will also outline the center's space commercialization role, research facilities and equipment, as well as space projects. NASA's initiatives to reduce technical, financial and institutional risks associated with doing business in space will be addressed.

Langley Director Richard H. Petersen will give the opening remarks at 8:30 a.m. in the Activities Center, Building 1222, following registration. Fred Allamby, Langley Commercialization Office, will give a brief Langley overview. Langley employees making presentations are John Samos, Technology Utilization; Kenneth H. Crumbly,

- more -

Space Technology Experiment Program; Jim Jones, Long Duration Exposure Facility; Bernard Garrett, Automated Space System Design and Analysis; Ray Hook, Space Station; Joseph Heyman, Acoustophoresis Separation Techniques in Space; Jag J. Singh, Growth of Thin Single Crystals; Richard Nelms, Remote Sensing; George M. Wood Jr., Expansion and Update of Mass Spectrometer Facility; and Eugene Kelsey, Ground Facilities.

NOTE TO EDITORS: Fred Allamby will be available for interviews prior to the conference and other presentors will be available the day of the symposium. To arrange an interview, please contact Jean Drummond, NASA-Langley Public Affairs Office, 865-3006.

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NASA News

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AC 804 865-2934

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For Release:

July 8, 1985

RELEASE NO. 85-38

NASA TO SPONSOR EXHIBITION AT NATIONAL SCOUT JAMBOREE

NASA will sponsor an exhibition at the 1985 National Scout Jamboree. The Jamboree, which will celebrate Scouting's 75th anniversary, will be held at Fort A. P. Hill, VA. The event is expected to draw more than 35,000 U. S. and international Scouts and Scout leaders, as well as many thousand general public participants.

The NASA exhibit includes subjects ranging from current aeronautics research to Space Shuttle and man's future in space. A 100-seat theater will offer video presentations and live programs throughout each day. Topics to be featured include Scout-oriented programs such as: "NASA and Scouting," "Student Opportunities at NASA" and "Careers in Aerospace." Programs such as "Living and Working in Space," "What's New in Aeronautics Research" and "Space Transportation" are also scheduled.

Located in the National Exhibits area at the Jamboree site, the NASA exhibition will be open to Scouts and the public July 22 through July 30, from 9 a.m. to 5 p.m. daily.

Astronaut Fred Gregory, a former Scout and long-time Scouting enthusiast, will participate in the Jamboree's opening program July 24 and will talk with Scouts in the NASA exhibition area on that day.

- more -

Live model rocket launch demonstrations and a presentation on earning the Space Exploration merit badge will be sponsored by NASA at 3 p.m. each day July 24 through July 28. The NASA AEROVAN, a walkthrough traveling exhibit unit with exhibits on aeronautics research, will also be on hand on those dates.

NASA Langley Research Center in Hampton, VA is serving as the lead center for coordinating the agency's participation in the Jamboree.

Many NASA centers sponsor Explorer Scout posts which provide unique opportunities for scouts to explore aerospace careers. Explorer post programs may be offered in astronomy, aeronautics, computer science and electronics. In these eighteen-week programs, Scouts are exposed to career information through classroom instruction, hands-on activities, projects, briefings and tours of NASA facilities.

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AC 804 865-2934

For Release:

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July 8, 1985

RELEASE NO. 85-40

NASA-LANGLEY HIRES DIRECTOR FOR CHILD DEVELOPMENT CENTER

Melissa Coleman-White, former assistant director of the Child Development Program at Langley Air Force Base, has been selected as director of the NASA-Langley Child Development Center, scheduled to open in September.

Art Friend, chairman of the Langley Exchange Council, said, "We are delighted to have Melissa Coleman-White as the director of our Child Development Center. She brings to the job the educational background and experience we were seeking. We received about 40 applications for the job and she was our choice from the start. We are dedicated to providing a quality center and with the hiring of Coleman-White, we are well on the way to achieving our goal."

Coleman-White, who began work July 8 preparing for the opening of the center, said she is prepared to create an innovative, professionally managed environment for the children of Langley's working parents. Her 10 years of experience in child care programs include positions as a Head Start teacher, Montessori teacher, family day care provider, program director for a United Way agency and a child development specialist for an infant intervention program, in addition to her assignment with the Air Force.

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She received a bachelor of science degree in child development from Virginia Polytechnic Institute and will complete a master of arts degree in child care administration from Nova University next spring. She then plans to pursue a doctorate in child psychology.

Coleman-White said parents who enroll their children in the Child Development Center should be delighted with the program envisioned since it will be designed to provide a loving, creative home-away-from-home for infants and preschoolers while their parents pursue their careers. The center will be state licensed and will apply for accreditation by the National Association for the Education of Young Children. Using state-of-the-art techniques in curriculum design, developmental screenings of all children, parenting education and high-quality staff training, she said the center will be a model program.

Government employees, on- or near-site contractors and university personnel are eligible to use the center.

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July 8, 1985

RELEASE NO. 85-41

HARRIS RECEIVES PRESIDENTIAL RANK AWARD

Roy V. Harris, Jr., Chief of the High-Speed Aerodynamics Division at NASA's Langley Research Center, recently received the Presidential Rank Award of Meritorious Senior Executive.

The citation accompanying the award read, "For sustained superior accomplishments in management of programs of the U.S. Government and for noteworthy achievement of quality and efficiency in the public service."

The award was presented June 27 at the fourth annual government-wide ceremony honoring the 50 recipients of the award held at the U.S. Office of Personnel Management in Washington, D.C.

Harris, nationally and internationally recognized as an authority in the field of supersonic aerodynamics, has made major contributions in the development of analytical techniques for aircraft design and evaluation.

A division chief since 1974, Harris directs research activities ranging from fundamental theoretical and experimental research through application of advance

- more -

technology to complete aircraft design. Under his leadership, the division performs research which is advancing the state-of-the-art in turbulent drag reduction, combat vehicle and missile aerodynamics, computational fluid mechanics, hypersonic aircraft aerodynamics and flight dynamics, and hypersonic propulsion, and advanced aircraft configurations

Harris and his wife, Mary Sue, live in Newport News, Va. They have two daughters.

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NASA News

National Aeronautics and
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AC 804 865-2934

For Release:

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July 12, 1985

RELEASE NO. 85-42

HIGH SCHOOL STUDENTS LEARN AND EARN AT NASA-LANGLEY THIS SUMMER

Fifteen high school students are participating in an eight-week intensive science and engineering apprenticeship program at the Langley Research Center this summer.

Area high school students participating are Pamela Ford, Menchville High School; Thomas Yip, Ferguson; Cassandra Jones, Hampton; Jane Nucup, Kecoughtan; Laura Reves, Warwick; Andrea Freeman, York; Darron Fullwood, Bethel; Catherine Kuo and Amanda Holt, Lafayette; Karen Ramsey and Kerry Peters, Deep Creek; Shannon Thornton, Bayside; Anna Hugo and Henry Pogorzelski, Kempsville; and Michelle Block, Green Run.

The Summer High School Apprenticeship Research Program, which was started in 1980 by the Public Affairs Division of NASA Headquarters, Washington, D.C., is designed for high school students who have demonstrated aptitude for and interest in science and engineering careers. Students who live within commuting distance of a participating NASA center, are U.S. citizens and will be 16 years old by the time the program begins in June are eligible to apply. The students selected are assigned to a mentor, who is a NASA scientist or engineer.

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As apprentices, the students learn and earn. They participate in an orientation process that provides them with an overview of the NASA center's mission and the activities necessary to accomplish the center's goals and objectives.

During their apprenticeship, the students complete designated assignments, prepare written reports, make oral presentations, and participate in a variety of enrichment activities under the careful supervision of the SHARP program staff and mentors.

SHARP is a feeder program that is being used to build a resource pool of potential applicants for future NASA employment in the fields of science and engineering. SHARP is specifically designed to attract and serve minorities and women who are under-represented in the NASA scientific and engineering workforce. The program provides them with first-hand experience and information that will help them make decisions about a career in science, engineering or mathematics.

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NASA News

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AC 804 865-2934

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For Release:

July 18, 1985

RELEASE NO. 85-43

NASA-LANGLEY WELCOMES SUMMER EMPLOYEES

NASA's Langley Research Center is providing more than 130 students with temporary employment this summer through various Federal Summer Employment Programs. The programs are under the direction of the Placement and Position Management Branch, Personnel Division.

More than 45 colleges and universities across the country are represented, and students have traveled to Langley from as far away as Connecticut, New York, Minnesota, Illinois, Indiana, Nebraska, South Dakota, and Florida to gain experience in their fields of study. Approximately 70 students are from the Peninsula and another 25 are from the Norfolk area.

This year, the majority of the summer employees are undergraduate and graduate students working as engineering aids, clerk-typists or student management aids.

Another program, the Summer Aid Program, provides 20 local youths with jobs which include clerical or technical responsibilities. These students are referred to the center by the Virginia Employment Commission.

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The Federal Summer Employment Programs' objectives include assisting the students in enriching their career goals with specialized training and actual work experience in or related to their major course(s) of study, and increasing their awareness of the full-time employment opportunities with the federal government after graduation. The program, while affording the students the chance to earn money for further education, provides additional personnel to supplement the center's staffing needs during the summer months.

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NASA News

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Hampton, Virginia 23665
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H. Keith Henry

Release No. 85-44

For Release:
July 23, 1985

NASA Facility Improved to Extend Landing Dynamics Research

NASA is wasting no time resuming use of its improved Aircraft Landing Dynamics Facility. The first test program to use this higher-speed, simulated landing track begins this month with a study related to the Space Shuttle main landing gear.

The facility has literally gone to new lengths to test advanced technologies for safer, more economical, all-weather aircraft ground operations. The track, used to test aircraft wheels, tires and landing gear, has been stretched to more than half a mile in length. This and related improvements have increased the facility's maximum test speed from 120 to 250 mph and makes practical for the first time, simulated landing tests of all modern aircraft and the Space Shuttle.

Located at NASA's Langley Research Center, Hampton, Va., the 29-year-old facility has been fully modernized in a two-and-one-half year effort costing $15 million.

The facility uses a high-pressure (3,150 psi) water jet system to propel a test carriage along the rail/track system where experiments are conducted under simulated runway conditions. Even before the expansion, it was believed to be the only facility in the world capable of testing full-size aircraft landing gear systems under closely controlled conditions simulating airplane takeoffs and landings.

The first research on the modified facility will study the cornering forces and spin-up characteristics of the Space Shuttle main gear tire. A tire-wheel-brake assembly will be mounted on the carriage for tests of tire wear and applied loads. Shuttle tires

- more -

"spin up" from zero to landing speeds almost instantly at touchdown.

The first tests will be run on the facility's existing smooth concrete test surface; later runs will require the "touchdown" area of the track to be changed to simulate the roughness and grooving of the Shuttle runway at the Kennedy Space Center, Fla. This relatively rough runway will then be painted and made smooth again — all to determine the best way to alter Kennedy runway characteristics to lessen shuttle tire wear.

Testing options at the Langley track include choosing between concrete or asphalt runway surfaces and from a full range of weather-related surface conditions. Dry, damp or flooded runways can be simulated, and slush and ice surfaces can be created.

Facility improvements include a higher capacity water jet system and a newly designed high-speed test carriage. The improved catapult system produces a 1.7-million-pound thrust on the carriage, resulting in a 17-g (gravity force) acceleration that pushes the carriage from 0 to 250 mph in two seconds in only 400 feet. The new carriage has a 20-by-40-foot test bay to accommodate larger test articles. Ten thousand gallons of water are used in a maximum speed run.

A wide variety of aircraft landing hardware tests, averaging about 75 to 100 runs each, will follow the Shuttle tests. An estimated 300 runs can be accomplished each year, with as many as half a dozen taking place on 1 day during the height of a test program.

One test program, for example, will take a close look at radial tires, which are not commonly used on aircraft. The NASA facility will test the tires for aircraft landing gear, comparing their performance with that of conventional bias ply tires. To make the best use of the facility, these tests will be run in conjunction with a Federal Aviation Administration/NASA program to gather information about runway surface traction.

Other test programs scheduled in the next several years include track tests to develop a data base for the National Tire Modeling Program, an analytical computer model to aid in the design of new tires, and a tire failure study.

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(WRITE OR TELEPHONE AC 804-865-2934 FOR LANGLEY PHOTO L-85-7,257.)

NASA News

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AC 804 865-2934

For Release:

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July 23, 1985

RELEASE NO. 85-45

BOWER AND HARRIS FILL NASA MANAGEMENT POSITIONS

Robert E. Bower and Roy V. Harris, Jr. have been selected to fill management positions at NASA's Langley Research Center.

Bower, former Director for Aeronautics, has been reassigned to the Office of the Director and designated Associate Director of the center.

Harris, former Chief of the High-Speed Aerodynamics Division, has been named Director for Aeronautics. He will temporarily remain Acting Chief of the High-Speed Aerodynamics Divsion.

Bower, a native of Gloversville, N.Y., has been a reviewer for the Applied Mechanics Review, a member of the Society of Automotive Engineers Research and Development Committee, and has lectured at several universities, including the executive professional development program, of which he is an alumnus, at the Polytechnic Institute of Brooklyn.

He is a consulting editor of the McGraw-Hill Encyclopedia of Science and Technology and an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA). In May 1984 he became Director of Region 1, and has served

—more—

on Long Island and Hampton Roads Section Councils. He is a member of Sigma Xi and Tau Beta Pi professional fraternities.

In his 22-year career with Grumman Aircraft Engineering Corporation (now Grumman Aerospace), Bower was a research engineer, research group leader, assistant to the Chief Technical Engineer, Chief of Engineering Development and Director for Advanced Development.

He was Langley's Director for Aeronautics from 1971 until his new appointment.

He graduated from Rensselaer Polytechnic Institute with bachelor and master of science degrees in aeronautical engineering in 1948 and 1949, respectively. He served in the U.S. Army from 1943 to 1946.

Bower and his wife live in Newport News. They have two sons.

Harris, who is nationally recognized as an authority in the field of supersonic aerodynamics, joined the Langley staff in 1958 as an aerospace research engineer. From 1959 to 1962 he was an Air Force officer assigned to NASA. He became Head of the Advanced Configuration Branch in 1963, and was selected Chief, High-Speed Aerodynamics Division, in 1974.

In June 1980, Harris was one of a NASA delegation to China that explored the prospects for NASA/Chinese cooperation in aeronautics.

A native of Augusta, Ga., Harris graduated from Richmond Academy in 1954 and earned a bachelor of science degree in aeronautical engineering from Georgia Institute of Technology in 1958. The author of over 30 technical publications, he holds a patent on a supersonic aircraft.

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Harris is an Associate Fellow of the American Institute of Aeronautics and Astronautics and was recently elected AIAA Vice-President for Technical Activities. He received the AIAA Sperry Award and a NASA Special Achievement Award for Exceptional Service in 1968. He was awarded the NASA Medal for Outstanding Leadership in 1982, and he received the Virginia Peninsula "Engineer of the Year" Award for 1983. This year he received the Presidential Rank of Meritorious Executive in the Senior Executive Service of the U.S. Government.

Harris and his wife live in Newport News. They have two daughters.

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NASA News

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For Release:

Brian Johns
(804) 865-3707

July 25, 1985

RELEASE NO. 85-46

CREEDON HEADS NEW LANGLEY DIRECTORATE

Dr. Jeremiah F. Creedon has been selected as Director for Flight Systems at NASA's Langley Research Center. This directorate was recently formed from the Office of the Director for Electronics.

Divisions under the new directorate include the Advanced Transport Operating Systems Program Office, the Information Systems Division, the Guidance and Control Division and the Flight Management Division.

Creedon joined Langley in 1963 in the Avionics Technology Research Branch of the Flight Electronics Division. He became Head, Control and Information Systems Section in 1969. He was chosen Assistant Head of FED in 1979, where he was until he attended Stanford University as a Sloan Fellow in 1981. Returning to Langley in 1983, he was Chief of the Flight Control Systems Division until named to his present position.

A graduate of the University of Rhode Island, Creedon received a bachelor of science degree in 1961 and a master of science in 1963. He graduated Cum Laude and was a member of Tau Beta Phi and Phi Kapppa Phi honorary fraternities. He earned a doctorate from the same university in 1970. He received a master of science degree in

—more—

management from Stanford University in 1982.

Creedon is the author of more than 20 technical publications. He is a member of the American Institute of Aeronautics and Astronautics and serves on that organization's guidance and control technical committee.

Creedon and his wife live in Newport News. They have three daughters.

- end -

NASA News

National Aeronautics and
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Jean Drummond
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For Release:

July 31, 1985

RELEASE NO. 85-48

NASA-LANGLEY DIRECTOR HEADS PENINSULA COMBINED FEDERAL CAMPAIGN

Richard H. Petersen, Director of NASA's Langley Research Center, will be the honorary chairman of this year's Combined Federal Campaign.

The Peninsula CFC raised over $1 million last year and is a major contributor to the Peninsula United Way. It also serves as a channel for approximately 43,000 employees of more than 47 federal installations and activities on the Peninsula to contribute to other community and charitable funds and a variety of national and international health and welfare agencies.

The Peninsula CFC Kickoff will be held Friday, September 13, in the NASA-Langley Activities Center. The campaign runs from September 16 through October 25.

The Peninsula Federal Coordinating Committee members are A. Gary Price, Executive Campaign Chairman, NASA-Langley; Chaplain Lawrence J. Biermann, Veterans Administration Medical Center; Lt. Col. Patrick T. McElgunn, Langley Air Force Base, Capt. Lois E. Bryant, Fort Monroe; William J. Franssen, Fort Eustis, Lionel Serating, Naval Weapons Station; and LCDR William P. Athayde, U.S. Coast Guard Reserve Training Center.

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NASA News

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For Release:

Jean Drummond
(804) 865-3006

August 1, 1985

RELEASE NO. 85-49

IVEY ATTENDS MAXWELL PROGRAM AT SYRACUSE UNIVERSITY

Dr. George W. Ivey Jr., Head, Mechanical Engineering Section, Facilities Engineering Division, at NASA's Langley Research Center, is attending the Maxwell Mid-Career Development Program at Syracuse University for the next 15 weeks.

The objectives of the program are to develop an understanding of the social, economic and political forces that impinge on public organizations and their management; to understand the dynamics of public organizations and their managerial systems and processes; to develop skills of analysis, communications, leadership and decision-making required of public managers; and to assess one's own managerial capabilities and design a personal career development strategy.

Ivey began his Langley career in 1964. As a Langley engineering manager, he has demonstrated his technical capabilities on both flight and ground-based aerospace sytems as well as his technical leadership capabilities. Participating in the Maxwell program will further his credentials for advancement to higher management and executive-level positions within NASA.

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Upon his return to Langley, Ivey will place special emphasis on increasing productivity in the organization to compensate for technological advances, increased workload and scarce resources. He will determine the best way to integrate a new group into the division, working across organizational lines, and will evaluate the center's five- and ten-year facilities plans to select and train new personnel to handle all phases of research facilities projects, assuring the availability of appropriate skill mixes.

A native of Lexington, S.C., Ivey received bachelor, master and doctorate degrees in mechanical engineering from the University of South Carolina in 1964, 1967 and 1976, respectively.

Ivey and his wife, Margie, live in Grafton. They have two children.

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August 1, 1985

RELEASE NO. 85-50

NASA-LANGLEY HONORS AERONAUTICAL PIONEER FRED WEICK AT COLLOQUIUM

Fred Weick, a pioneer researcher of the NACA-Langley Memorial Aeronautical Laboratory, is one of the living legends of American aeronautics. In recognition of the 60th anniversary of his employment with NACA, Weick will be honored at a NASA-Langley colloquium Monday, August 19.

Dr. James Hansen, Langley historian and former professor of history at the University of Maine, will present a lecture, "The Life and Times of Fred Weick, Aeronautical Pioneer," in the Langley Activities Center, Building 1222, at 2 p.m, preceded by a press briefing with Hansen and Weick at 1:15.

In his slide presentation, Hansen will relate some of the more fascinating details of Weick's long, fruitful and adventurous career in aeronautical research and design, with emphasis on his productive years at Langley.

Weick's contributions include the design of the Langley Propeller Research Tunnel; pioneering the design of light private-owner airplanes, steerable tricycle landing gear,

- more -

and the low-speed NACA cowling—for which Langley won its initial Collier Trophy; and conducting extensive research on lateral control. He is the author of a well-known textbook on propeller design. After leaving NASA in 1936, Weick became widely known as the designer of the Ercoupe light airplane. He later moved to Texas A&M where he designed the Ag-1 agricultural airplane and made contributions to numerous other general aviation airplanes.

- end -

NASA News

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Jean Drummond
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August 8, 1985

RELEASE NO. 85-52

AMELIA EARHART FELLOWSHIP GOES TO NASA ENGINEER

Vicki S. Johnson, an aerospace engineer in the Aeronautical Systems Office at NASA's Langley Research Center, has been awarded the Zonta Amelia Earhart Fellowship for the 1985-86 academic year.

The fellowship, sponsored by Zonta International, a worldwide classified service organization of executive women in business and the professions, is awarded annually to women for graduate study in aerospace-related science and engineering. The grant was established in honor of Earhart, an internationally famous flyer who disappeared in 1937 on a round-the-world flight. She was the first woman to fly across the Atlantic Ocean as a passenger in an airplane in 1928, the first woman to make a solo transatlantic flight in 1932, and the first person to fly from Hawaii to California in 1935. Earhart was a Zonta member from 1928 to 1937.

In her studies under the Earhart grant, Johnson will pursue a doctorate in aerospace engineering at the University of Kansas, where her major concentration will be in airplane design. Johnson chose to study under Dr. Jan Roskam at the university

- more -

because "Roskam is recognized as the authority on airplane design at universities in the United States." Johnson said the proposed graduate program corresponds directly to her job at Langley and will enhance her ability to carry out future assignments and to contribute more fully to NASA.

"My responsibilities in the Aeronautical Systems Office (ASO) include configuration development, weights and balance, and the sizing of subsonic and supersonic aircraft to meet specific design requirements," Johnson explained. Her first major task at Langley in June 1982 was to modify the ASO's airplane sizing program to handle turboprop airplanes as well as turbofan airplanes. "Using the modified program, a study of comparable wing-mounted turboprop and turbofan airplanes was conducted, showing that the turboprop achieved its greatest potential at speeds less than those envisioned," she said.

Johnson has been responsible for the Rockwell Configuration Development System, which is an aircraft geometry creation and manipulation program, installing the code on the Langley computers, arranging for training for Langley users and coordinating the transfer of CDS information between users at the center. She also used the system to conduct studies of numerous airplane concepts.

"I developed a computer-aided design system for the conceptual design of supersonic aircraft," said Johnson, "and then designed a Mach 3.5 interceptor to illustrate the use of the system." This project resulted in her thesis for a master's degree from Geroge Washington University.

In addition, Johnson received a bachelor of science degree in aerospace engineering from the University of Missouri at Rolla.

She is a member of the American Institute of Aeronautics and Astronautics, the Engineers Club of the Virginia Peninsula and the Virginia Peninsula Business and Professional Women's Club.

Johnson lives in Hampton, Va.

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For Release:

August 13, 1985

RELEASE NO. 85-53

NASA'S LANGLEY RESEARCH CENTER OPENS CHILD DEVELOPMENT CENTER

For many months managers at NASA's Langley Research Center have been working on plans to open a child development center to benefit employees and contractors at Langley. This fall the child care center will become a reality.

The Langley Child Development Center, under the direction of Melissa Coleman-White, will care for 38 children comprised of eight infants and 30 preschoolers, beginning September 3. The center will operate from 6:30 a.m. to 5:30 p.m. Monday through Friday, except for scheduled holidays.

Preceding the opening, a ribbon-cutting ceremony and a open house will be held at the center. The ribbon-cutting ceremony is slated for August 22 at 9 a.m and will feature NASA Langley Research Center Director Richard H. Petersen as the guest speaker. The open house will be held August 26 from 10 a.m. to noon.

According to Art Friend, Chairman of the NASA Exchange Council, under which the center operates, "The center will be a very attractive, happy place for children. It will be well-equipped with appropriate toys, educational equipment and a creatively designed playground."

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Coleman-White said the child development center has been the focus of considerable attention by the local news media. "Except for the military, few organizations in our area, public or private, provide this type of support for its employees. In fact, only about 500 organizations nationwide provide child care centers for their employees," she explained. "According to most authorities in the field, however, provision of child care as part of a company's overall fringe benefits program is the 'coming wave of the future.' With the opening of the LCDC September 3, Langley appears to be at the forefront of this trend."

Coleman-White, former assistant director of the Child Development Program at Langley Air Force Base, has had 10 years of experience in child care programs including positions as a Head Start teacher, Montessori teacher, family day care provider, program director for a United Way agency and a child development specialist for an infant intervention program.

NOTE TO EDITORS: Coleman-White will be available for interviews at both events. To arrange an interview, please call Jean Drummond, NASA-Langley Public Affairs Office, 865-3006

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NASA News

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For Release:

August 15, 1985

RELEASE NO. 85-54

LEWIS ASSIGNED TO TEACHER IN SPACE PROJECT AT NASA HEADQUARTERS

Dr. Mary H. Lewis, an Education and Information Specialist in the Office of External Affairs at NASA's Langley Research Center, has been reassigned to NASA Headquarters in Washington, D.C., as Assistant Manager for the Teacher in Space Project. She is assigned to the Elementary and Secondary Programs Branch, Educational Affairs Division, for a period of one year, participating in NASA's Critical Assignment Development Program.

In this capacity, Lewis is assisting the Project Manager in planning and implementing the on-board activities of the teacher for Space Shuttle mission 51L; overseeing the assignments and progress of the pre- and post-flight activities of the eight finalists to be assigned to NASA centers; and coordinating the activities of the 104 teacher "Space Ambassadors." Additionally, she is responsible for budget forecasting and control, and staff coordinator.

As an Education and Information Specialist at Langley since July 1983, Lewis has served as a liaison between Langley and the educational community in the five states of

- more -

Virginia, West Virginia, North Carolina, South Carolina and Kentucky. She has managed special programs involving educators and students. Among these programs are experiments which are included on Space Shuttle missions, such as SEEDS experiment on Langley's Long Duration Exposure Facility and the Norfolk Public Schools Get Away Special Project. She has directed the NASA Governor's School for the Gifted summer program and the MATHCOUNTS program.

Lewis first worked at Langley from 1979 to 1981 under the auspices of the Intergovernmental Personnel Agreement. During that time, she developed four career guidance publications which are distributed nationwide to acquaint secondary school students with careers in science, engineering and technology.

A Richmond native, Lewis began her career in 1973 as an English teacher in the Hampton Public Schools. From 1976 to 1979 she served as a high school counselor. Subsequent to the two-year exchange program with Langley, she returned to the Hampton Public Schools as the Program Developer for the Gifted and Talented Program, where she created and managed the after-school program for the gifted and talented students.

Lewis received her bachelor of arts degree from Christopher Newport College in 1973. She was awarded master and doctor of education degrees from the College of William and Mary in 1976 and 1983, respectively.

She is past president of the Peninsula Counselors Association and a member of the Virginia Counselors Association.

Lewis lives in Newport News.

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NASA News

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For Release:

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August 19, 1985

RELEASE NO. 85-55

FLOYD ATTENDS MIDDLE MANAGEMENT PROGRAM FOR WOMEN AT SIMMONS COLLEGE

Carolyn E. Floyd, a technical information specialist at NASA's Langley Research Center, has been selected to participate in the Middle Management Program for Women at Simmons College.

The program is a ten-week executive development program designed to assist employers in industry, government agencies and the nonprofit sector to prepare qualified women for positions in middle management. The MMP seeks candidates who have demonstrated long-term career commitment and a desire for professional growth.

"After working in the library and information science field for 12 years, I am ready to expand my horizons to supervisory/management or project program responsibilities in the information profession," Floyd said. "Participating in the Simmons College, Middle Management Program, will provide an opportunity for me to enhance capabilities in decision making, planning, budgeting, leadership, communication and

- more -

supervisory skills. Becoming efficient in these areas will greatly enhance my ability to carry out present and future assignments."

As a group leader in the Technical Library Branch, Research Information and Applications Division, Floyd selects, evaluates and disseminates information in research, engineering and administrative programs to Langley and NASA employees and other government agencies, technical organizations and the national aerospace community.

"I expect to gain managerial and supervisory skills in directing library programs and developing skills in interpersonal relationships and effective delegation," Floyd said.

Floyd joined the Langley staff as a librarian in July 1973, after receiving a bachelor of science degree in English with a minor in library science from Bennett College, Greensboro, N.C. She earned a master of science degree in library and information science from Western Michigan University, Kalamazoo, Mich. in 1976.

She has served on several Equal Opportunity Programs subcommittees. She also participated in the development of the Aerospace Research Information Network (ARIN) by serving on the standards and software selection subcommittees.

Floyd lives in Hampton, Va.

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For Release:

Melissa Huffman
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August 16, 1985

RELEASE NO. 85-56

TEACHERS ARE THE STUDENTS AT NASA'S LANGLEY RESEARCH CENTER

For the third year in a row, the Langley Research Center is sponsoring a workshop designed to help industrial arts teachers. Joseph Davenport, Chief, Fabrication Division, explained that this program directs teachers to the important and new developments in fields such as electronics and manufacturing. The teachers also learn what to convey to their students.

The 18 Hampton and Newport News Public School teachers are trained on equipment that is too expensive for the school systems to buy. Then the teachers can bring their students here to be taught, or engineers can sometimes take the equipment to them.

The teachers are chosen by and receive pay from the school systems. The facilities and equipment are provided by Langley. Each teacher has a host in a specific section, but the experience a teacher has determines the independence level.

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The program originated at Langley and has been very successful during the past three years. Langley also works with Wyle Laboratories, RCA and Newport News Shipbuilding and Dry Dock Company to place teachers in different work environments for more diverse learning experience.

Last year, Davenport gave presentations to all the school systems in eastern Virginia. Sixteen of them are now interested in participating in such a program. Davenport says the Hampton and Newport News program will be phased down to possibly five teachers from each to allow Poquoson, York and Williamsburg schools to participate.

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For Release:
September 3, 1985

RELEASE NO. 85-57

ABEL NAMED ASSISTANT CHIEF, LOADS AND AEROELASTICITY DIVISION, AT NASA'S LANGLEY RESEARCH CENTER

Irving Abel, former Technical Assistant to the Director for Structures, has been selected Assistant Chief, Loads and Aeroelasticity Division, at NASA's Langley Research Center.

In his new position, Abel plans and directs experimental and analytical research on aeroelastic and unsteady aerodynamic problems relating to aircraft and space vehicles.

Abel joined Langley in 1963 as an aerospace engineer in the Aeroelasticity Branch. From 1977 to 1979 he served in the Dynamics Loads Branch. He then was named to the Aeroelastic Optimization Office, where he worked until being selected as Assistant Head, Multidisciplinary Analysis and Optimization Branch in 1980. Abel served from 1983-1984 at NASA Headquarters in Washington, D.C., as the Program Manager for Structures and Dynamics. Upon returning to Langley in July 1984, he was assigned to the Structures Directorate Office.

Abel graduated from the University of Miami with a bachelor of science degree in engineering science in 1963. In 1968, he received his master of science degree in applied mechanics from the University of Virginia.

- more -

The author of 36 technical papers and presentations, Abel has received three special achievement awards and one NASA group achievement award for research in aeroelasticity and active controls. He is a member of the American Institute of Aeronautics and Astronautics.

Abel and his wife, the former Susan Lee Gordon, live in Newport News. They have two sons.

- end -

NASA News

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For Release:

September 3, 1985

RELEASE NO. 85-58

PETERSEN TO ADDRESS STATUS OF ADVANCED SUPERSONIC TRANSPORT AT NASA COLLOQUIUM

"The Advanced Supersonic Transport — Status" will be discussed at a NASA-Langley Research Center colloquium Monday, September 9, in the Activities Center.

Langley Director Richard H. Petersen, who presented this same lecture last April at the AIAA 1985 Annual Meeting and International Aerospace Exhibits in Washington, D.C., will speak at 2 p.m., preceded by a press briefing at 1:15 p.m.

In his talk, Petersen will focus primarily on the technology aspects beginning with a brief review of the past supersonic transport (SST) activities, the highlighting of the advances in the various discipline, technology areas that, when integrated properly, show enormous promise of an efficient and highly productive SST that could serve an ever-expanding market, especially in the Pacific Basin.

Some major considerations that include the necessity of a focused technology program, development costs and financial considerations, all of which, according to Petersen, are necessary precursors to an advanced supersonic transport, will also be discussed. Lastly, an attempt will be made to summarize the AST picture so as to enhance the forum for truly controversial and possibly revolutionary vehicles.

- more -

Petersen has been Langley Director since February 1985 and is the former Deputy Director. Before his assignment to Langley, he was Chief of the Aerodynamics Division at NASA's Ames Research Center, Moffett Field, Calif., where he directed a 200-person team conducting research in aerodynamics and fluid mechanics in seven major wind tunnels. His initial work was in theoretical and experimental aerodynamics, particularly in the supersonic and hypersonic speed ranges. More recently, he directed research programs in aircraft noise, hydrogen-fueled aircraft, short takeoff and landing aircraft and computer analysis of aircraft performance, as well as spacecraft studies and budget and facility planning.

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For Release:

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September 6, 1985

RELEASE NO. 85-59

HAYDUK, KRODEL, LUTHER SELECTED FOR NASA'S CAREER DEVELOPMENT PROGRAM

Three Langley Research Center managers have been selected to participate in NASA's Career Development Program at NASA Headquarters in Washington, D.C., for the next 12 months.

Dr. Robert J. Hayduk, Leader, Seat and Airframe Crash Dynamics Group, Structures and Dynamics Division, will be assigned to the Materials and Structures Division, Office of Aeronatuics and Space Technology, where he will serve as the Acting Program Manager for the Structures and Dynamics Program.

Ronald R. Krodel, Acting Assistant Chief, Management Support Division, will be working on special projects within the Office of Management and the Office of Aeronautics and Space Technology.

Michael R. Luther, Electronics Engineer in the Flight Electronics Division, will be the Deputy Program Manager for the Upper Atmosphere Research Satellite Program in the Office of Space Science and Applications.

The objectives of NASA's Career Development Program are to assist in developing potential supervisors and project and program managers; to foster better appreciation

- more -

and understanding of NASA Headquarters functions and operations on the part of center personnel and likewise, a better appreciation and understanding of center functions and operations on the part of NASA Headquarters personnel; and to provide additional training and development in specific discipline or functional areas.

While at NASA Headquarters, Hayduk will be responsible for those elements of the OAST program associated with flight loads, structural dynamics and aeroelastic response, active and passive control of loads and response, crash dynamics, noise transmission and attenuation, space structural concepts and advanced computational analysis methods.

Hayduk began his NASA career in 1962 as an aerospace technologist. He has received numerous awards for his work on the behavior of light aircraft in simulated and actual crashes. He will receive a NASA Exceptional Service Medal in November.

Hayduk earned a bachelor of science degree in physics from St. Francis College in 1962. He received master of science and doctorate degrees in engineering mechanics in 1968 and 1978, both from Virginia Polytechnic Institute and State University.

Hayduk and his wife, Sarah, live in Newport News. They have four children.

Krodel came to Langley in 1959 and has been a procurement assistant, supply technician, contract administrator and a procurement agent. He was Head, Property Management Branch, Management Support Division, from 1974 until he assumed his present position in October 1984.

Krodel and his wife, Janie, live in Hampton. They have three children.

Luther, in his Headquarters assignment, will share with the program manager responsibility for all aspects of the UARS program, including the development and

- more -

implementation of UARS' ten instruments, ten theoretical investigations, the observatory and the ground data handling system, and the development of a UARS automated management information system.

Luther's work at Langley includes directing and monitoring activities to achieve overall mission objectives of the Earth Radiation Budget Experiment Nonscanner instrument.

He earned a bachelor of science degree in mathematics from Birmingham-Southern College in June 1967 and a master of science degree in applied mathematics from Auburn in June 1969.

The author of eight technical publications, Luther has received three Special Achievement Awards and one Group Achievement Award for his work on the Earth Radiation Budget Satellite Experiment. In November, he will be presented with a NASA Exceptional Engineering Achievement Medal.

Luther and his wife, Judy, live in Williamsburg. They have one son.

- end -

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Maurice Parker
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For Release:

September 17, 1985

RELEASE NO. 85-62

ORBITER COLUMBIA MODIFIED FOR RE-ENTRY RESEARCH

Significant changes have been made in the appearance of Columbia, NASA's first Space Shuttle Orbiter, to accommodate three research experiments to measure Orbiter aerodynamic and thermodynamic characteristics as it re-enters Earth's atmosphere. Researchers will use the flight data to develop future space transportation systems.

The most obvious change in Columbia's appearance is a cylindrical housing that has replaced the fintip atop the vertical tail. The new experiment pod is approximately 20 inches in diameter and is capped at the leading edge by a spherical dome. The pod contains equipment for the Shuttle Infrared Leeside Temperature Sensing (SILTS) experiment.

SILTS will obtain high-resolution infrared images of the upper (leeside) surfaces of Columbia's port wing and fuselage as the Orbiter re-enters Earth's atmosphere. The infrared images will provide detailed temperature maps at the surface of the leeside thermal protection materials. The maps will indicate the amount of aerodynamic heating of the surfaces in flight, acquiring data that cannot be adequately simulated in ground tests.

- more -

SILTS images will be obtained by an infrared camera, mounted inside the dome, that will alternately view Columbia's left wing and fuselage through two windows. The windows will be protected from debris during vehicle handling and launch by plugs that fill the window cavities. The plugs will be ejected when the experiment begins, and the windows will be actively cooled during re-entry by the injection of gaseous nitrogen into the cavities. Experiment data will be stored on a tape recorder.

The experiment will be initiated by Columbia's computer at the time of entry interface, about 400,000 feet. It will end after the Orbiter passes through the period of significant aerodynamic heating.

A less obvious change to Columbia is a completely new nosecap to house the Shuttle Entry Air Data System (SEADS) experiment. The nosecap has 14 penetration assemblies distributed about its surface, each containing a small hole through which local surface air pressure will be measured during entry.

Measurement of the distribution of air pressure about the nosecap will allow precise post-flight determination of the Orbiter's attitude relative to the oncoming airstream and the density of the atmosphere through which the vehicle has flown.

Accurate knowledge of these factors, coupled with vehicle motion information (measured by a separate experiment), are required to determine Orbiter aerodynamic flight characteristics. The lack of accurate air data has prevented scientists from determining exact Orbiter inflight aerodynamic characteristics. SEADS will provide accurate data from an altitude of about 90 kilometers (56 miles) through landing.

A third experiment, not visible from outside the Orbiter, is located inside the nose wheel well. The Shuttle Upper Atmosphere Mass Spectrometer (SUMS) will complement the SEADS experiment by providing atmospheric density information at altitudes above 80 kilometers (50 miles).

SUMS will sample air at Columbia's surface through a small hole, located just aft of the nosecap, measuring the number of molecules of various gas species. Information will be used to determine the atmospheric density that, with vehicle motion information, will allow determination of Orbiter aero- dynamic characteristics at altitudes where the atmosphere is extremely thin. Aerodynamic flight at these altitudes cannot be simulated in ground tests.

The SUMS instrument is a mass spectrometer originally developed for the Viking spacecraft that landed on Mars in 1976. It has been modified to operate in the re-entry flight environment of the Orbiter.

The experiments were developed at NASA's Langley Research Center, Hampton, Va., as part of the Orbiter Experiments Program, managed by NASA's Office of Aeronautics and Space Technology, Washington, D.C.

Columbia spent the past two years at Rockwell International Corporation's Shuttle facility in Palmdale, Calif., receiving extensive modifications. Recently transferred from Palmdale to the Kennedy Space Center, Fla., Columbia is scheduled to return to space in December 1985.

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For Release:

Jean Drummond
(804) 865-3006

September 23, 1985

RELEASE NO. 85-63

SLIWA NAMED ASSISTANT DIVISION CHIEF AT NASA'S LANGLEY RESEARCH CENTER

Dr. Steven M. Sliwa has been chosen Assistant Chief, Guidance and Control Division, at NASA's Langley Research Center. In this position, he is responsible for planning, advocating and leading research in the development of guidance and controls technology for aeronautic and space vehicles.

Sliwa joined the Langley staff in September 1978 as an aerospace technologist in the Active Controls Project Office and later was assigned to the Theoretical Mechanics Branch. From January 1984 to January 1985 he served a temporary assignment at NASA Headquarters, Washington, D.C., as Acting Manager, Aeronautical Controls and Guidance Program.

Upon his return to Langley, he became Assistant Head, Theoretical Mechanics Branch, and then Assistant Head, Analytical Methods Branch. He has specialized in aircraft conceptual design optimization, modern control theory, adaptive control, software design and econometric forecasting.

Sliwa received a bachelor of science degree in aerospace and mechanical sciences from Princeton University in 1977, a master of engineering degree in flight sciences from

- more -

George Washington University in 1978 and a doctorate in aeronautics and astronautics from Stanford University in 1983.

The author of 25 technical papers, Sliwa has received two outstanding performance citations for his work. He is a member of the American Institute of Aeronautics and Astronautics.

Sliwa lives in Newport News.

- end -

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For Release:

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September 23, 1985

RELEASE NO. 85-64

LANGLEY HOLDS CFC KICKOFF; WTKR'S ED HUGHES TO SPEAK

The Langley Research Center will begin the 1985-86 Combined Federal Campaign with a special kickoff ceremony Friday, October 4.

Ed Hughes, news anchor for WTKR television, will give the keynote address at the ceremony, which will be held in the Activities Center, Building 1222, at 2 p.m.

Hughes has been in broadcasting for 24 years, 18 of those years at WTKR Channel 3 in Norfolk. He has been a reporter, producer, special projects director, managing editor, and now is co-anchor and producer of the 6 and 11 p.m. news.

He has won many awards for his reporting: the Gavel Award from the American Trial Lawyers Association for his documentary on "No Fault Automobile Insurance;" the Air Space Writers Award for his documentary on the Navy's F-14 Tomcat fighter plane; and numerous awards from the Associated Press and United Press International for in-depth reporting and spot news coverage.

Raised in Boston, Mass., Hughes served four years in the U.S. Navy and attended the University of Washington in Seattle.

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The Combined Federal Campaign provides an opportunity once a year for civilian and military employees of the government to contribute to many worthy health, welfare and community service organizations. The funds provided to these agencies permit them to relieve suffering, provide care for the young, aged, homeless and hungry, and bring hope to the depressed. It is the one campaign which helps people—our families, friends and neighbors—all year long.

The Langley Research Center is the second largest CFC contributor on the Peninsula and Langley Director Richard H. Petersen is launching this year's campaign with a goal of $230,000. A one-day solicitation will be held at Langley October 8.

The Peninsula Combined Federal Campaign goal for this year is $950,000. The money will be distributed among the Peninsula United Way, Williamsburg United Way, National Health Agencies, National Service Agencies and International Service Agencies. Each of these organizations distributes its funds directly to subsidiary agencies and each agency is dedicated to helping people, not only in this area but around the world.

- end -

NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

Maurice Parker
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September 24, 1985

RELEASE NO. 85-65

FUTURE SPACE ACTIVITIES WORKSHOP PLANNED OCT. 8-10

NASA will hold a national workshop on in-space research, technology and engineering from October 8 to 10, 1985. The workshop is sponsored by NASA's Office of Aeronautics and Space Technology, Washington, D.C.

Approximately 1,400 people have been invited to attend the workshop, which will be held at the National Conference Center in Williamsburg, Va., adjacent to the Williamsburg Hilton Hotel.

The purpose of the workshop is to identify candidate activities for in-space research, technology and engineering (RT&E) for the year 1990 and beyond; validate RT&E themes as a way to aid planning and coordination of experiments activity; identify precursor experiments that use the Space Shuttle; and recommend ways to assure continued involvement by users of RT&E.

Dr. Raymond S. Colladay, NASA Associate Administrator for Aeronautics and Space Technology, is general chairman of the workshop. Technical program co-chairmen are Dr. Leonard A. Harris, OAST Director for Space; and James M. Romero, OAST Assistant Director for Space (Space Station Technology). Dr. Colladay will also speak at a workshop banquet Wednesday, October 9.

- more -

The workshop will consist of parallel sessions by five panels that will review potential experiments. The panels will be composed of university, industry and government members who are expert in their technical fields. A final plenary session will allow the panel chairmen to present summaries, conclusions and recommendations.

The panels will concentrate on five themes: Space Structure (Dynamics and Control); Space Environmental Effects; Energy Systems and Thermal Management; Fluid Management; and In-Space Operations.

Technical coordinators for the workshop are Dr. Roger A. Breckenridge and Richard A. Russell, both of Langley's Space Station Office.

Additional information concerning the workshop may be obtained by calling Kay Millen at (804) 865-4834 or Robert Wright at (804) 865-2487.

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NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

Jean Drummond
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October 1, 1985

RELEASE NO. 85-66

LANGLEY EMPLOYEES HONORED WITH SERVICE AWARDS

More than 140 NASA-Langley Research Center employees with 45, 40, 35 and 30 years government service were honored with emblems and certificates during the 1985 fiscal year.

The 40- and 45-year pins were presented by the center director, the 35-year pins by the program directors and the 30-year pins by the division chiefs.

Receiving awards this year were:

FORTY-FIVE YEARS' SERVICE: Joseph Getsug;

FORTY YEARS' SERVICE: Freda N. Anderson, Charles A. Baldwin, Ivan E. Beckwith, Leon A. Blount, Walter E. Bressette, Sherman A. Clevenson, Herbert J. Cunningham, Walter J. Dale, Thomas J. Gibbons, Albert W. Hall, Jane S. Hess, William B. Igoe, Mary M. Jenkins, James W. Lynch, Frederick R. Matthews, James W. McNamara Jr., Collis P. Moore Jr., Albert A. Schy, R. Earl Williams and Paul L. Yeager;

THIRTY-FIVE YEARS' SERVICE: Thomas A. Byrdsong, William R. Deshazor, Robert N. Desmarais, Fred Ferrari, Jr., Kenneth W. Holley, Walter Illg, Muriel M. Jarrett, Robert H. Kirby, Ernest A. Mackley, John P. Mugler Jr., Charles H. Russell, R. Paul Seaford, Henry T. Thornton Jr., Sue E. Wilder and Raymond H. Womble;

- more -

THIRTY YEARS' SERVICE: Daisy W. Alston, H. Fuller Arnn Jr., Wendell G. Ayers, C. Donald Babb, Richard E. Bardusch, Frank R. Batten, Billy W. Beasley Sr., William D. Beasley, Albert H. Bell, Thomas A. Blackstock, Clifton L. Blizzard, William J. Boyer, Dorothy O. Braswell, Donald Brown;

Ronald D. Brown, Forrest F. Bruce, Walter E. Bruce Jr., Donald C. Bryan, Harold D. Burks, David H. Butler, James W. Campbell, Arlen F. Carter, David J. Carter Jr., Claude B. Castle, Andrew J. Chapman III, Donald M. Coffey Jr., James A. Coleman, Rufus K. Dail, Sidney C. Dixon;

Marvin B. Dow, Donald G. Eide, Donald L. Ewton, Benjamin R. Freeman, William H. Fuller Jr., Thomas G. Gainer, Jack F. Gayle, Richard B. Geissinger, Kenneth E. Glover, Ernest L. Greene, Ray W. Gregory, Shirley S. Grice, Joseph F. Guarino, Emily B. Hackney, E. Eugene Hall;

Daniel R. Hamlin, Charles A. Hardesty, Sallie M. Harvey, Kelley C. Hinnant, Walter C. Hoggard, W. Ray Hook, John C. Houbolt, Floyd G. Howard, William E. Howell, Jarrett K. Huffman, Warren D. Hypes, Charlie M. Jackson Jr., John R. Karns, Charles B. Karpa, Lloyd S. Jernell;

William H. Kinard, Phillip J. Klich, Richard L. Kurtz, Harold C. Lester, Ronald J. Logioco, Evelyn S. Martin, Roy W. Mason, Darlene R. Mays, Clifton M. McMillian, Lucille C. Merrill, Jean D. Miller, John S. Mixson, Maurice K. Morin, Archie D. Myers, Arthur L. Newcomb Jr.;

Gordon Owsley, James C. Patterson Jr., William F. Perdue, William L. Poole, Christine B. Richie, Marion E. Richie, John F. Royall Jr., William E. Sanders, B. J.

Schlichenmayer, Kenneth A. Seals, Coefield Silver, Rodney A. Smith, John H. Soule, Amos A. Spady Jr., Cary R. Spitzer;

Robert L. Stallings Jr., William F. Stewart, Robert L. Swain, Robert T. Swann, Lawrence W. Taylor Jr., Nancy L. Taylor, Robert G. Thomson, L. Frederick Tomlinson, Walter A. Vahl, John A. Walker, William L. Weaver, Robert G. Webb, Deene J. Weidman, Leland E. Wilkinson, Clyde W. Winters, William G. Witte Jr. and Gerard E. Woodbury.

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NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

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For Release:

October 1, 1985

RELEASE NO. 85-67

SHEFFIELD DISCUSSES SPACE TRANSPORTATION WITHOUT ROCKETS

"Space Transportation Without Rockets: Beanstalks, Tethers, Launch Loops and Indian Rope Tricks" will be discussed at a Langley Research Center colloquium Tuesday, October 15, in the Activities Center, Building 1222.

Charles Sheffield, vice president of the Earth Satellite Corporation and president of the Science Fiction Writers of America, will speak at 2 p.m., preceded by a press briefing at 1:15.

In the past few years, a number of unconventional techniques have been proposed to achieve orbit and to move through space without the use of expendable reaction mass. Sheffield will discuss the technological basis for the proposed methods, together with some of their implementation difficulties.

Born in England and educated at St. John's College, Cambridge, Sheffield holds bachelor of arts and master of arts degrees in mathematics, as well as a doctorate in theoretical physics.

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Sheffield has been continuously involved in the United States' Space Program since 1963. He has served as a NASA principal investigator, as a consultant to NASA Headquarters, as an advisor to the Office of Technology Assessment and as an expert witness to both House and Senate on the subjects of the Space Program and international space treaties.

In addition to overseeing approximately 50 technical papers and monographs, his written works include the best-selling non-fiction volumes "Earthwatch," and "Man on Earth," plus five novels and four short story collections.

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NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

Jean Drummond
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October 7, 1985

RELEASE NO. 85-68

NASA-LANGLEY RESEARCH CENTER APPRENTICES TO GRADUATE

Eight NASA-Langley Research Center apprentices will receive their journeyman certificates Friday, October 11, at the 41st Annual Completion Exercises for Engineering Technicians.

The ceremony will begin at 1:30 p.m. in the Activities Center, Building 1222.

Dwight G. McSmith, who retired as a supervisory engineering technician from the Langley Research Center in 1983 with more than 40 years of government service, will be the guest speaker for the apprentice graduation ceremony.

Joan D. Oster, Engineering Technican Designer (Architectural), Facilities Engineering Division, will be the speaker for the Class of 1985 and Frederick M. Thompson, Coordinator, Engineering Technician Apprentice Program, Personnel Division, will present the certificates.

The graduates and their trades are:

Engineering Technician (Research Facilities Operations), Operations Support Division: Beverly J. Anderson and R. Craig Leggette;

- more -

Engineering Technician (Mechanical Development), Fabrication Division: Richard B. Ivey;

Engineering Technician Designer (Architectural), Facilities Engineering Division: Joan D. Oster;

Engineering Technician (Mechanical), Systems Engineering Division: Wendy F. Pennington and Charles J. Wittkopp;

Engineering Technician (Materials Processes), Fabrication Division: Clarence E. Stanfield;

Electronics Technician, Fabrication division: Sang Q. Tran.

McSmith graduated from the Langley Apprentice School as an aircraft modelmaker. At the time of his retirement, he was responsible for the operation of the Impact Dynamics Research Facility, where a general aviation aircraft crash safety program was conducted to obtain information on aircraft crashes under controlled conditions. The information obtained from the simulated crashes has been essential to predicting structural collapse and to designing new concepts for seats, occupant restraint systems and cabin interiors.

McSmith serves as a consultant and advisor to "Jungle Aviation and Radio Services/Wycliffe Bible Translators" and "Mission Aviation Fellowship." He recently returned from several weeks in the Orient, presenting aviation safety seminars to representatives of government, industry and missionary aviation personnel in the Philippines, Indonesia and Irian Jaya.

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NASA News

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

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(804) 865-3006

For Release:

October 23, 1985

RELEASE NO. 85-69

NASA RESEARCHERS, DARDEN AND HAYNES, RECEIVE NTA AWARDS

Dr. Christine Darden and Gilbert A. Haynes, both NASA-Langley Research Center employees, recently received awards from the National Technical Association (NTA) at the organization's 57th annual conference in Houston, Texas.

Darden, a Senior Project Engineer in the Advanced Concepts Branch, High-Speed Aerodynamics Division, received the Dr. A. T. Weathers Technical Achievement Award, given to an individual member of the NTA who has earned recognition through significant technical achievements or contributions. President of the Hampton Roads Chapter of the NTA, Darden is cited for her exceptional work in the area of supersonic aerodynamic research, and she is a nationally recognized expert in the area of sonic boom minimization.

Haynes is Head, Experimental Flight Systems Section, Flight Control Systems Division. He received the Samuel R. Cheevers Distinguished Service Award, the highest award presented to a member of the NTA, which is presented to an individual who has distinguished himself/herself through service to the NTA. He is cited for his continuous outstanding and innovative contributions as a member and leader of NTA for a period of

- more -

about 15 years. He has served at the local level as president and symposium chairman and on the national level as president, treasurer, national symposium chairman and national personnel committee member.

Darden received a bachelor of science degree from Hampton Institute in mathematics/physics. She earned a master of science degree from Virginia State College and a doctorate from George Washington University in mechanical engineering-fluid mechanics.

Haynes received a bachelor of science degree in physics from Virginia State University and a master of science degree from Old Dominion University.

The National Technical Association, founded in 1926, is concerned with the participation of minorities in meeting the challenge of modern technology.

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NASA News

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Space Administration

Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

Jean Drummond
(804) 865-3006

October 23, 1985

RELEASE NO. 85-70

NASA-LANGLEY STAFF MEMBERS RECEIVE ADVANCED DEGREES

Thirteen NASA-Langley Research Center staff members have received advanced degrees through the center's Graduate Study Program during Fiscal Year 1985.

The program, established in the late 1940s, provides Langley scientists, engineers and administrators an opportunity to improve their proficiency in aeronautical and space research and earn advanced degrees while working at Langley. Approximately 900 employees have been awarded master of science or doctorate degrees through the program.

Four employees received doctorate degrees through various universities. Catherine A. Bigelow, Materials Division, received the doctor of philosophy in civil engineering from Georgia Institute of Technology; William B. Compton, Transonic Aerodynamics Division, doctor of science in fluid mechanics and thermal sciences from George Washington University; Sheila T. Long, Materials Division, doctor of philosophy in physics from North Carolina State University; and Patrick C. Murphy, Flight Dynamics and Control Division, doctor of science in aeronautics from George Washington University.

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The professional degree of engineering has been awarded to Pamela B. Richardson, High-Speed Aerodynamics Division, from George Washington University.

Master of science degrees were awarded to the following eight employees: Gregory C. Anderson, Space Systems Division, master of aeronautical/astronautical engineering from the University of Washington; John C. Lin, High-Speed Aerodynamics Division, master of science in mechanical engineering from Old Dominion University; Michael D. Bray, Analysis and Computation Division, master of science in electrical engineering from George Washington University; Mary-Anne Kaczynski, Analysis and Computation Division, master of science in computer science from the College of William and Mary;

Beth B. Lee, Flight Dynamics and Control Division, master of engineering in mechanical engineering from the University of Virginia; Melvin Ferebee, Space Systems Division, master of science in mathematics from the College of William and Mary; James B. Miller, Systems Engineering Division, master of engineering from Old Dominion University; and Vicki S. Johnson, Aeronautical Systems Office, master of science in flight sciences from George Washington University.

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NASA News

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

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October 31, 1985

RELEASE NO. 85-71

NASA HONORS EMPLOYEES AT AWARDS CEREMONY

NASA will honor employees who have made outstanding contributions in aeronautical and aerospace research during the past year at the Annual Honor Awards Ceremony Wednesday, November 13.

Dr. Raymond S. Colladay, NASA Associate Administrator for Aeronautics and Space Technology, will be the guest speaker for the ceremony, which will begin at 1:30 p.m. in the Langley Research Center's Activities Center, Building 1222.

NASA awards will be presented as follows:

Outstanding Leadership Medal: Jerry C. South and Charles V. Woerner.

Exceptional Scientific Achievement Medal: Robert C. Harriss, Paul M. Hergenrother and Anne K. St. Clair.

Exceptional Engineering Achievement Medal: L. Robert Jackson, Leonard P. Kopia, Michael R. Luther and Clarence P. Young Jr.

Exceptional Service Medal: William P. Chu, William R. DeShazor, James J. Fayu, Robert L. Fox, Robert J. Hayduk, James F. Kibler, Homer G. Morgan, Norma B. Schultz, Ann H. Suit, Glenn R. Taylor and Winn R. Vaughan.

- more -

Public Service Medal: Joseph Guy, Raymond J. Hesser, John O. Robbins and Sally K. Schaffner.

Group Achievement Award: Aircraft Landing Dynamics Facility (ALDF) Propulsion Control Valve Team, Differential Absorption CO Measurement Team, ERBE Data Management Team, ERBE Instrument Team, F-106 NEMP Test Team, LARC Controlled Impact Demonstration Team, Pathfinder I Development Team, SAGE II Experiment Team, Scramjet Engine Research Team and Space Station Systems Engineering and Integration Software Team.

Public Service Group Achievement Award: Kentron International Inc., OAO Corporation and Systems and Applied Sciences Corporation.

Langley awards will be presented as follows:

H.J.E. Reid Award: Patrick Minnis and Edwin F. Harrison.

Public Service Award: System Development Corporation, Ball Aerospace Systems Division and the Environmental Health Staff Team.

Outstanding Volunteer Service Award: Charles T. Solomon, L. Frederick Tomlinson, Bernice A. Barrack and P. Frank Quinto.

Group Achievement Award: Advanced Fighter Propulsive Control Team, Advanced Technology Airfoil Test (ATAT) Research team, Advanced Turboprop Subsonic Aerodynamics and Acoustics Research Team, Aircraft Landing Dynamics Facility (ALDF) Facility Activation Team, Aircraft Landing Dynamics Facility (ALDF) Project Design Team, Aircraft Landing Dynamics Facility (ALDF) Project Management Team, Airport '85 Interference Effects Study team;

Cash Management System Design Team, Composite Wheelchair Team, Decoupler Pylon Team, Deployable/Erectable Trade Study for Space Station Truss Structures Team, ERBE Algorithm Development Team, 15-Meter Hoop Column Deployable Concept for Langley Space Antenna Applications Team, General Files and Mail Operations Team, High-Speed Natural Laminar Flow Airfoil/Wing Design and Experiment Team, LaRC Controlled Impact Demonstration Team;

LTPT Renovation and High Lift Test Team, Non-Intrusive Combustion Diagnostics Team, OAST-1 Solar Array Photogrammetry Team, 1 percent Scale Shuttle Ascent Loads Model Design and Fabrication Team, Open House Planning Committee, SAGE II Correlative Measurement Team, Shuttle Exhaust Plumes/Aerodynamic Load Investigation Team, Step Phase "A" Design Team, Transonic Dynamics Tunnel Upgrade Project Team, VPS-32 Supercomputer Implementation Team, X-29 NTF Model Brazing Team.

Colladay, Associate Administrator for OAST since June, is responsible for the overall management of the agency's aeronautics, space technology and terrestrial energy programs, including the institutional management of NASA's Ames, Lewis and Langley research centers.

Colladay was named Deputy Associate Administrator, OAST, in April 1982, and Acting Associate Administrator in April 1985. He began his career with the Lewis Research Center in 1969 and held several top management positions there as well as at NASA Headquarters in Washington, D.C.

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NASA News

National Aeronautics and
Space Administration

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Hampton, Virginia 23665
AC 804 865-2934

For Release:

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October 31, 1985

RELEASE NO. 85-72

AIRCRAFT HANDLING AND PILOT EVALUATION TO BE DISCUSSED AT NASA COLLOQUIUM

Robert P. Harper Jr., Head of Flight Research at Arzin/Calspan, Buffalo, and George E. Cooper of G.E. Cooper Associates, Saratoga, Calif., will be the guest speakers at the November 12 Langley Research Center colloquium.

Their lecture, "Handling Qualities and Pilot Evaluation," will be held in the Activities Center at 2 p.m., preceded by a press briefing at 1:15.

Cooper and Harper will discuss the Cooper-Harper handling qualities rating scale and guidelines will be presented for the design and conduct of evaluation experiments and for the analysis of evaluation data.

The piloted airplane, a closed-loop dynamic system with focus on the difficulties involved in the assessment of its quality (or suitability) for the performance of piloted tasks, will be discussed. A historical background will be offered that illustrates the existence of closed-loop dynamic problems throughout the history of piloted flight and sets forth the development of flight test methods to examine these problems.

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NASA News

National Aeronautics and
Space Administration
Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

For Release:

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November 12, 1985

RELEASE NO. 85-73

HOUBOLT, NASA CHIEF AERONAUTICAL SCIENTIST, RETIRES

Dr. John C. Houbolt , Chief Aeronautical Scientist at the Langley Research Center, retired October 31, with more than 30 years of government service.

Houbolt joined NASA's predecessor agency, the National Advisory Committee for Aeronautics, in June 1942 as an aeronautical engineer in Langley's Structures Research Division, conducting research on the stability and dynamics of aircraft structures. In 1949 he was appointed Assistant Chief, Dynamic Loads Division, pursuing research problems in aeroelasticity (flutter, gust loads, landing loads and acoustics) in application to aircraft and space vehicles. He was named Chief, Theoretical Mechanics Division, in 1961, engaged in research on special problems of space flight, such as rendezvous, communication satellites and launch vehicle dynamics.

In February 1963 he left Langley to become Senior Vice President and Senior Consultant for Aeronautical Research Associates of Princeton, Inc., Princeton, N.J., where he was a consultant in aeronautics, astronautics and advanced technology,

- more -

specifically in the fields of aeroelasticity, structures, flight mehcanics, system analysis and guidance and control. He returned to Langley in January 1976 as Chief Aeronautical Scientist, serving as a scientific and technical consultant to Langley.

Prior to 1942 Houbolt was the junior engineer for the City of Waukegan and a bridge engineer for Illinois Central Railroad. He served in the Army Air Corps from 1944 to 1946.

Houbolt received bachelor and master of science degrees in civil engineering from the University of Illinois in 1940 and 1942, respectively. He received a doctorate in technical sciences from ETH (Swiss Federal Institute of Technology) in Zurich, Switzerland, in 1957 and in 1975 received an honorary doctorate degree.

From 1945 to 1963 Houbolt was an instructor at the University of Virginia Graduate Extension Division and the Virginia Polytechnic Institute and State University Graduate Extension.

The author of more than 120 technical reports, Houbolt received the Rockefeller Public Service Award to undertake graduate study at ETH, a NASA Exceptional Scientific Achievement for the conception and development of the Lunar-Orbit Rendezvous concept for performing manned lunar landing missions, a University of Illinois Distinguished Civil Engineering Alumni Award, a University of Illinois Achievement Award; and the AIAA Dryden Research Lecture Award. He was the first recipient of the Structures, Structural Dynamics and Materials Award presented by the American Institute of Aeronautics and Astronautics.

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Houbolt, a Fellow of the AIAA, has served the institute in numerous capacities, such as Vice President, Technical AIAA and Board of Directors; Chairman of AIAA National Honors and Awards Committee; Associate Editor, AIAA Journal of Spacecraft and Rockets; and Associate Fellow. He was affiliated with the Air Force Scientific Advisory Board for 15 years as advisor and chairman of several ad hoc groups.

He and his wife, Mary, live in Williamsburg. They have three daughters.

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NASA News

National Aeronautics and
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Langley Research Center
Hampton, Virginia 23665
AC 804 865-2934

Same as NASA 85-171 12/13

For Release:

Brian Johns

December 13, 1985

RELEASE NO. 85-96

PYROTECHNIC-ACTIVATED EMERGENCY AIRCRAFT EXITS MAY SAVE LIVES

The use of pyrotechnic-activated emergency exit systems aboard commercial transport aircraft may save lives in an emergency situation, according to a researcher at NASA's Langley Research Center, Hampton, Va.

The use of pyrotechnic components aboard commercial aircraft may sound dangerous, but Laurence J. Bement, an aerospace technologist specializing in pyrotechnic-activated aircraft escape systems thinks the fears are largely unsubstantiated. He points out that military aircraft have used these escape systems for more than 20 years and NASA has used them in their manned space flight programs as far back as Project Mercury in the 1960s. He feels the advantages of these escape systems could be realized aboard commercial aircraft.

The emergency egress system, he proposes, will be more reliable and more effective in aiding the rapid evacuation of the airplanes and more cost-effective than existing mechanical and electrical systems.

"What we have done is take the best materials and applications from years of pyrotechnic usage and tried to assemble the best escape system, using our past experiences," said Bement. The pyrotechnic-activated escape systems used by the U.S. armed forces have already saved approximately $10 million by avoiding component replacement costs.

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One Air Force system, the Emergency Life-Saving Instant Exit, uses pyrotechnic charges to sever a panel inside the aircraft door. Another, the NASA General Aviation Egress Opening system, explosively creates an opening in the fuselage without modifying the airframe structure.

Both systems work well and have proven to be safe and reliable. However, they both add to the weight and complexity of the aircraft and do not increase the structural efficiency of the airframe.

To improve existing systems, Bement studied the possibility of replacing fuselage skin sections with an explosively-severed composite material panel. Graphite/epoxy and fiberglass composite panels were tested as possible replacements. The graphite/epoxy panel was found to be better than the fiberglass panel.

Not only was the graphite epoxy easier to sever than the original fuselage material, but the composite panel was much lighter and more crashworthy. Once activated, the explosive material severed the panel from the fuselage and jettisoned the panel outward. No debris is projected inward and no sound or over-pressure hazard existed inside the aircraft.

The composite system is more reliable than existing mechanical and electrical systems and would require less maintenance since this system is expected to last at least 15 years. The composite panel would be bolted to the primary structure and would be a load-carrying component, unlike existing emergency exits.

Bement estimates that using composite panels with the pyrotechnic system could reduce the weight of existing emergency exits by 30 to 50 percent. If the airframes are originally designed with the composite panels, the weight reductions would be far greater. The fuselage would not require as much support structure around the emergency door frames since the light-weight composite panels are capable of carrying loads.

The explosive used in this system is hexanitrostilbene (HNS), an organic compound insensitive to handling, impact, gunfire and lightning and was unaffected by 50 hours of exposure to a temperature of 350 degrees Fahrenheit. The HNS will burn if exposed to a flame, but it will not explode.

Another attractive feature is the compound's explosive power. In a test of the Langley General Aviation Opening system, less than 0.4 ounce of the compound was needed to severe a panel about 30-inches square.

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(NOTE: NASA-LANGLEY PHOTOGRAPH L-83-1568 IS AVAILABLE TO ACCOMPANY THIS RELEASE AND WILL BE PROVIDED BY WRITING OR TELEPHONING AC 804-865-2934/2.)

NASA News

National Aeronautics and
Space Administration

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For Release:
December 2, 1985

RELEASE NO. 85-98

NASA SCIENTISTS DISCOVER LONG-TIME INCREASES IN GASES THAT AFFECT EARTH'S CHEMISTRY & CLIMATE

Nature Magazine, the international science journal, is featuring three scientific papers written by atmospheric scientists at NASA's Langley Research Center in its November 21-27 issue.

The three papers address a major discovery in atmospheric chemistry: the finding that levels of two environmentally significant atmospheric gases—methane and carbon monoxide—may be increasing over a longer time period than was previously thought.

Continuous ground-based measurements of methane and carbon monoxide have been obtained only since about the end of 1977 by several research groups around the world. Those measurements indicate that, during the last few years, methane may be increasing at the rate of one to two percent per year and carbon monoxide by two to six percent a year.

Methane is a "greenhouse gas" because of its effect on Earth's climate. Methane also helps produce ozone near the ground, where ozone is a pollutant and an irritant. In addition, the chemical breakdown of methane leads to the formation of carbon monoxide, which also leads to the chemical production of ozone near the ground.

- more -

Methane and carbon monoxide control the chemical destruction of the hydroxyl radical (composed of one atom of oxygen and one of hydrogen) that is the major chemical scavenger in the troposphere, destroying many man-made pollutants.

The post-1977 measurements have led scientists to two important questions: (1) Were atmospheric levels of methane and carbon monoxide increasing before 1977? and (2) What are the effects of these increases on the photochemistry and chemistry of Earth's atmosphere?

Seeking an answer to the first question, Dr. Joel Levine and Dr. Curtis Rinsland, of Langley's Atmospheric Sciences Division, began a search for past, previously unanalyzed data that might shed light on possible increases in methane and carbon monoxide.

The detective work eventually led Rinsland to the published spectra of a study of the sun that was conducted back in 1950 and 1951, an ancient period to atmospheric scientists.

The early study was conducted at the Jungfraujoch International Scientific Station, located more than two miles high (3,580 meters) in the Swiss Alps, where scientists from Belgium were obtaining infrared solar absorption spectra to better understand the radiation emitted by the sun.

The solar radiation, however, while traversing the atmosphere to reach the Jungfraujoch spectrograph, was absorbed by the very small levels of atmospheric methane and carbon monoxide.

Rinsland obtained copies of the early solar spectra. Methane and carbon monoxide are only minute trace gases in the atmosphere, but Rinsland—an expert in astronomical spectroscopy—was able to analyze the absorption of these two atmospheric gases in the historic solar spectra.

Preliminary analyses of the data by Rinsland and Levine indicate that, during the past 35 years, atmospheric methane may have increased as much as 40 percent and atmospheric carbon monoxide as much as 70 percent.

To answer the question concerning the effects of these increases on the photochemistry and chemistry of the atmosphere, Levine and Rinsland—in collaboration with Langley computer specialist Geoffrey Tennille—have used a photochemical mathematical model to study the impact of increasing amounts of the two gases.

Their calculations indicate that increasing levels since 1950 may have caused a 25 percent decrease in tropospheric levels of the hydroxyl radical. While only a trace species, the hydroxyl radical is the overwhelming chemically active species in the troposphere, and readily and rapidly transforms one atmospheric species to another. It chemically cleanses the atmosphere of many man-made species and is involved in the photochemistry of ozone and acid precipitation.

The atmospheric scientists will continue their analysis of the Alpine spectral data, seeking to deduce levels of additional tropospheric trace gases. They will also make further theoretical calculations to assess how the troposphere's trace gas composition and photochemistry have varied during the last several decades. Extrapolation of these results will allow them to speculate on the trace gas composition and photochemistry of the atmosphere in the future.

Despite its importance in better understanding Earth's atmosphere—past and future—the study to date has cost NASA a total of only $53.20—the cost of obtaining the Belgian spectra.

- end -

NASA News

National Aeronautics and
Space Administration

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For Release:
December 13, 1985

RELEASE NO. 85-99

LANGLEY EXPERIMENTS TAKE COLUMBIA'S AERODYNAMIC PULSE

When Space Shuttle Columbia re-enters Earth's atmosphere just after dawn of December 23, several instruments will begin taking measurements of the spacecraft's aerodynamic and thermodynamic characteristics.

SEADS, SILTS and SUMS are the acronyms for three experiments developed at NASA's Langley Research Center in Hampton, Va. They are part of the Orbiter Experiments Programs managed by NASA's Office of Aeronautics and Space Technology, Washington, D.C.

Columbia, the first Shuttle vehicle to go into space, is making its first flight in two years. It was pulled from flight service in December 1983 for extensive overhaul, including modification to accommodate the Orbiter experiments.

The three Langley experiments are:

o Shuttle Entry Air Data System (SEADS).

o Shuttle Infrared Leeside Temperature Sensing (SILTS) experiment.

o Shuttle Upper Atmosphere Mass Spectrometer (SUMS).

The attached fact sheet provides descriptions of each of these experiments and information on their value in designing future space transportation systems.

—END—

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IMMEDIATE

FACT SHEET

ORBITER EXPERIMENTS (OEX) PROGRAM
LANGLEY RESEARCH CENTER EXPERIMENTS

The routine operation of NASA's Space Transportation System provides opportunities for research on the aerodynamic and aerothermodynamic qualities of vehicles in hypersonic flight during ascent and entry through Earth's atmosphere. As the world's first reusable spacecraft, the Shuttle Orbiter is an ideal carrier for experiments to collect flight data that will expand and improve the technology base required to develop second generation space transportation systems.

The Orbiter Experiments (OEX) Program, managed by NASA's Office of Aeronautics and Space Technology, allows researchers to design, develop and fly such experiments aboard a Shuttle Orbiter.

Three of the OEX investigations, conceived and developed at NASA's Langley Research Center, Hampton, Va., will fly for the first time aboard the Orbiter Columbia during the 61-C mission in December 1985.

SHUTTLE ENTRY AIR DATA SYSTEM (SEADS)

The Shuttle Entry Air Data System (SEADS) will measure the distribution of air pressure around the Orbiter's nosecap during entry. The pressure data will be processed after the mission to provide precise determination of the Orbiter's attitude relative to the oncoming airstream and the density of the atmosphere through which it has flown.

Accurate knowledge of these "air data" parameters, coupled with vehicle motion data (measured by a separate instrument), is required to determine aerodynamic flight characteristics of Shuttle Orbiters. Lack of air data has hindered engineers from making an accurate determination of those characteristics.

The SEADS experiment is a new Orbiter nosecap that contains 14 penetration assemblies distributed across the nose surface in a cross-shaped pattern. (Figure 1.) Each penetration assembly contains a small hole through which local surface air pressure will be sensed during ascent and entry. Internal "plumbing" connects the pressure orifices to 28 pressure sensors mounted outside the nosecap cavity on the nosecap aft bulkhead. (Figure 2.) Each orifice is connected to two pressure sensors, one of which is sensitive to high-level pressures (0 to 20 psia) and one of which is sensitive to low-level pressures (0 to 1 psia).

All components of the penetration assemblies and nosecap internal tubing are made of coated columbium. They will be subjected to temperatures in excess of 2,500 degrees Fahrenheit during entry.

The SEADS experiment will be turned on just before Columbia's deorbit engines fire to initiate Orbiter entry into Earth's atmosphere. Experiment data will be recorded on an OEX tape recorder aboard the vehicle. The system will provide accurate measurement of air data from an altitude of about 90 kilometers (56 statute miles) through landing.

Principal technologist for the SEADS experiment is Paul M. Siemers III.

Figure 1

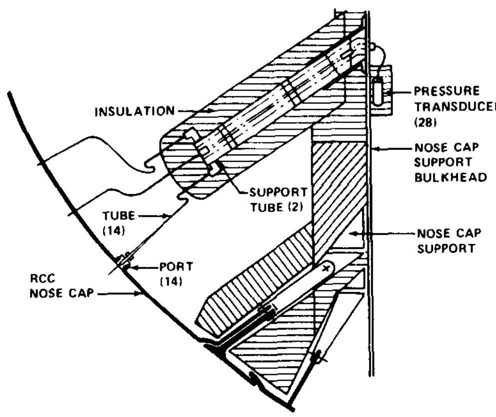

Figure 2

SHUTTLE INFRARED LEESIDE TEMPERATURE SENSING (SILTS)

The Shuttle Infrared Leeside Temperature Sensing (SILTS) experiment will obtain high-spatial-resolution infrared images of the upper (leeside) surfaces of the Orbiter's port wing and fuselage during entry through the atmosphere. The infrared images will provide detailed "maps" of the surface temperatures of leeside thermal protection materials. The information will indicate the amount of aerodynamic heating to the leeside surfaces in flight. This environment cannot be adequately simulated in ground facilities.

The top section of Columbia's vertical tail has been replaced with a special pod to house components of the SILTS experiment. (Figure 3.) The pod is approximately 20 inches in diameter and is capped at the leading edge with a hemispherical dome that has two infrared-transparent windows. The dome contains an infrared scanning system, a data and control electronics module and a pressurized nitrogen system. (Figure 4.)


Figure 3

The infrared scanning system uses the optical assembly from an off-the-shelf infrared camera, but all camera electronics were designed especially for the experiment. The camera is mounted in the dome so that it can rotate to view the Orbiter through either of the two windows. One window looks toward the fuselage; the other toward the port wing. The windows are protected from debris during ground preparation and launch by plugs made of flexible insulating material.

The pressurized nitrogen system supplies gaseous nitrogen to various components during operation of the experiment. A cryostat (to maintain a constant low temperature) in the infrared scanning system converts a small amount of nitrogen gas to liquid nitrogen to cool the infrared detector. The pressurized nitrogen operates pin-pullers that begin the ejection of the window protection plugs, and injection of gaseous nitrogen cools the windows during entry so they do not become radiators in the infrared.

The SILTS experiment will be initiated by an Orbiter computer command when Columbia reaches entry interface altitude (about 400,000 feet). The window protection plugs will be ejected and the camera will begin operating.

The camera will rotate between the two windows, alternately viewing the fuselage and the port wing about every 11 seconds, until Columbia drops to an altitude of about 80,000 feet.

SILTS EXPERIMENT COMPONENTS

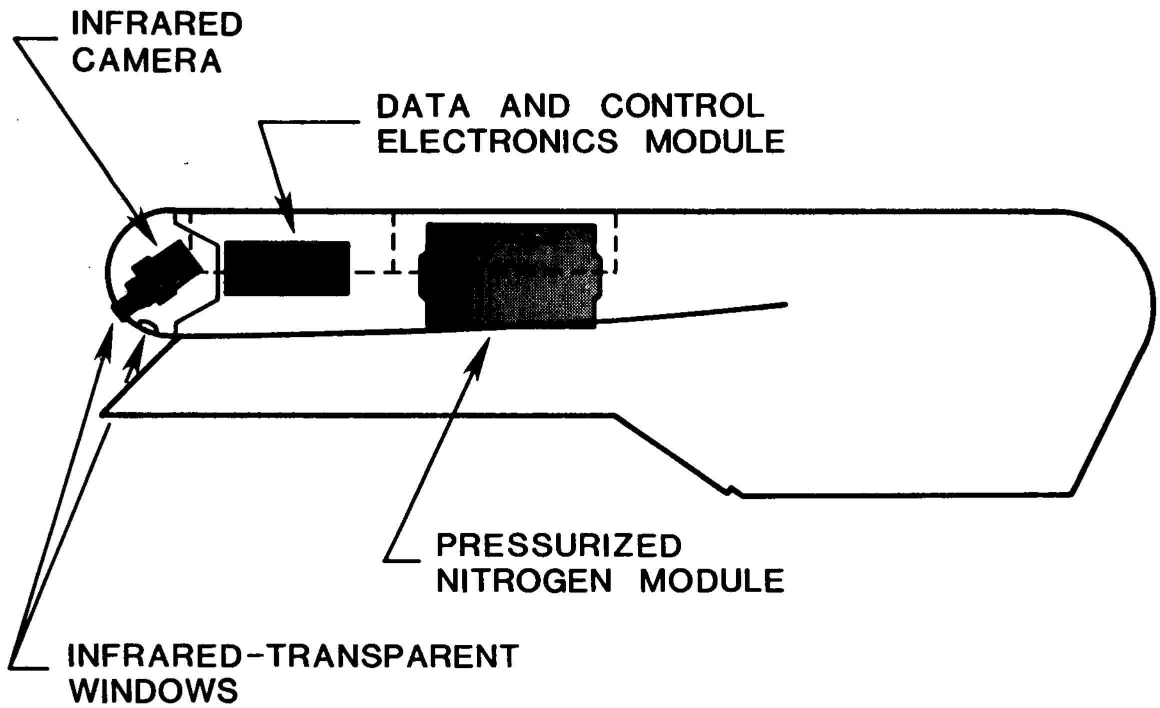

Figure 4

More than 110 pairs of infrared images will be collected during about 20 minutes of significant aerodynamic heating. Experiment data are recorded on the OEX tape recorder for processing and analysis after the mission.

Principal technologists for the SILTS experiment are David A. Throckmorton and E. Vincent Zoby.

SHUTTLE UPPER ATMOSPHERE MASS SPECTROMETER (SUMS)

The Shuttle Upper Atmosphere Mass Spectrometer (SUMS) experiment complements the SEADS experiment by gathering atmospheric density information at altitudes above 90 kilometers (56 statute miles). SUMS will sample the gas at Columbia's surface through a small hole located just aft of the nosecap and forward of the nose wheel door. The SUMS instrument will identify and measure the quantities of the various gas species present. Data analysis after the mission will allow determination of atmospheric density.

SUMS data will be used in conjunction with vehicle motion information to determine Orbiter aerodynamic characteristics at altitudes where the atmosphere is rarified (extremely thin). Aerodynamic flight at these altitudes cannot be accurately simulated in ground facilities.

The SUMS instrument is a mass spectrometer originally developed for the Viking Mars missions. (Figure 5.) It has been specially modified to operate in the entry flight environment of the Orbiter. The instrument is mounted on the forward bulkhead of Columbia's nose wheel well. An inlet system of tubing, valves and a pressure sensor connect the instrument to the surface sampling port.

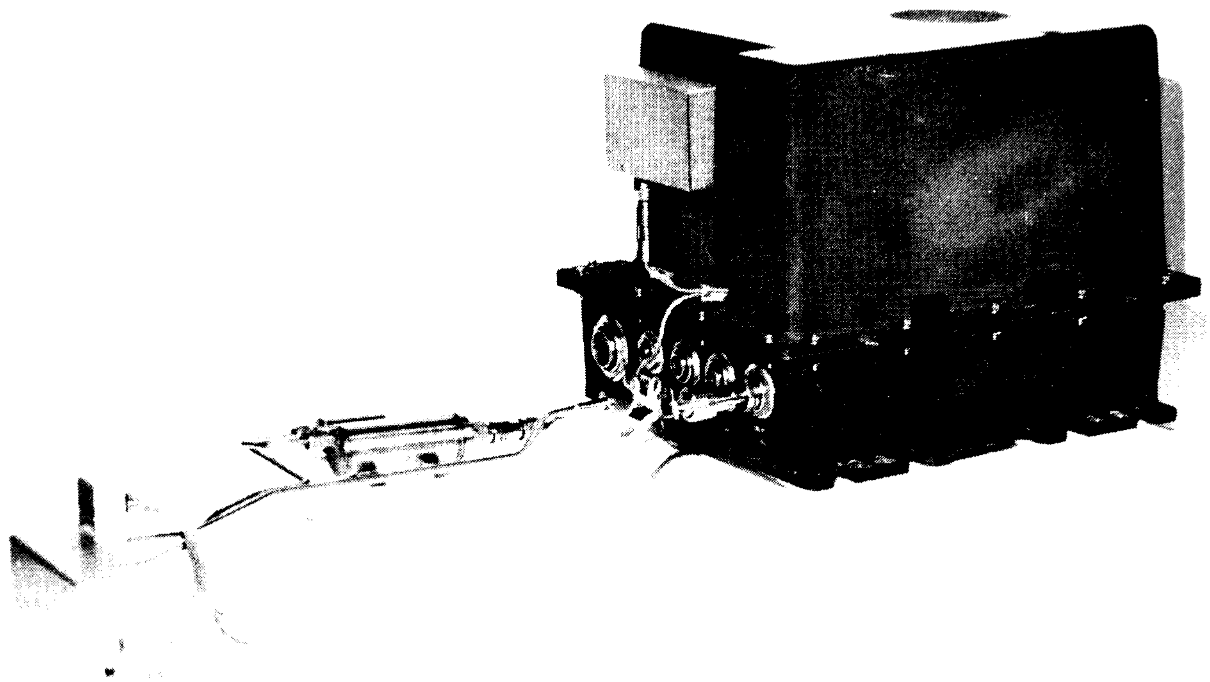

Figure 5

The instrument will be activated just before Columbia's deorbit engines fire. SUMS will collect data from orbit down to an altitude of about 90 kilometers (56 miles), when an inlet valve will close, sealing the instrument from the sampling port to prevent saturation of the instrument.

Principal technologists for the SUMS experiment are Roy J. Duckett and Robert C. Blanchard.

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For Release:

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December 20, 1985

RELEASE NO. 85-100

HANSON RETIRES FROM NASA

Perry W. Hanson, Assistant Chief, Loads and Aeroelasticity Division, at NASA's Langley Research Center, will retire from government service December 31.

In this position since July 1980, Hanson has planned and directed experimental and analytical research on aeroelastic and unsteady aerodynamic problems relating to aircraft and space vehicles.

Hanson joined the Langley staff in March 1953 as an aeronautical research engineer in the Dynamic Loads Division. In February 1965 he was named Head, Launch Vehicle Aeroelasticity Section and in November 1972 he was named Assistant Head, Aeroelasticity Branch.

He served in the U.S. Navy as a fighter pilot from 1945 to 1949 and from 1953 to 1955.

A native of Hinton, WV, Hanson received a bachelor of science degree in aeronautical engineering in 1952 and a master of science degree in applied mechanics in 1953 from Virginia Polytechnic Institute.

The author or co-author of 34 technical publications and papers, Hanson is an Associate Fellow of the American Institute of Aeronautics and Astronautics and is a

- more -

registered professional engineer in Virginia. He holds a patent for a lift balancing device. In November 1984, he received a NASA Exceptional Engineering Achievement Medal "in recognition of exceptional engineering achievements in experimental aeroelasticity, including pioneering efforts in buffet loads for launch vehicles and aircraft and identifying the adverse effects of supercritical airfoils on wing flutter."

Hanson and his wife, Beverly, live in Hampton. They have two sons and a daughter.

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December 20, 1985

RELEASE NO. 85-101

BOEING OFFICIAL TO SPEAK AT NASA-LANGLEY COLLOQUIUM

An aerodynamics official from the Boeing Commercial Airplane Company in Seattle, Wash., will be the guest speaker at a NASA-Langley Research Center colloquium January 13, 1986.

Dr. John H. McMasters will present a lecture, "Reflections of a Paleoaerodynamicist," in the Activities Center, Building 1222, at 2 p.m., preceded by a press briefing at 1:15.

In his lecture, McMasters will bridge a gap that sometimes exists between the engineering and biological sciences and demonstrate that while there is little commercial value in designing better butterflies, an interdisciplinary approach to the study of problems in biological flight can be of advantage to both disciplines. He will establish a general framework showing the relationship between size, weight, speed and energy consumption of various locomotion schemes (both biological and man-made). The discussion will then be particularized to the range of flying devices from insects and seeds to jet transport aircraft.

- more -

The topics selected by McMasters are intended to demonstrate examples in nature of good design in an overall system, and to show that the perspective an engineer can bring to the study of biology (and paleontology in particular) is important to a full understanding of natural flight and aeronautical technology in general.

McMasters is the lead engineer of the stability and control research group at Boeing. He has worked as a low-speed aerodynamicist, conducting research in high-lift, large-scale vortex flows and the aerodynamic aspects of airframe noise.

The author of over 50 technical papers, reports and articles on a variety of low-speed flight and design topics, McMasters is writing a book for the Smithsonian Institution with the working title, "From Dragonflies to the Space Shuttle: The Biological Origins of the Aeroplane." Publication is anticipated for early 1987.

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December 20, 1985

RELEASE NO. 85-102

URANUS ENCOUNTER COVERAGE AVAILABLE BY SATELLITE TRANSMISSION

NASA's Voyager 2 will make its closest approach to Uranus, flying 81,500 kilometers (50,600 miles) above the cloud tops of the seventh planet, at 1 p.m. EST, January 24, 1986. It will be the first spacecraft to reach the planet, providing our first close look at this system.

School systems, museums and individuals, having access to an antenna dish, can receive the signal transmitted from the Jet Propulsion Laboratory in Pasadena, CA. The satellite location data is as follows:

SATCOM F2R
Transponder 13
C Band
72 degrees W longitude
3954.5 megahertz
Vertical Polarization
Audio 6.8 MHz

Much of the data collected during the spacecraft's closest approach, however, will be recorded on the spacecraft for playback to Earth on following days. A schedule of events to date are:

January 24, 1986	1 p.m. EST	Press briefing
January 23, 24, 26, 27	8 to 9 p.m. EST	NASA Science Reports
January 28	8 to 9:30 p.m. EST	NASA Science Reports

Other transmission times may be inserted at a later date.

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